DOCUMENT RESUME

ED 329 195 HE 024 311

TITLE	Florida Health Professions Education Profiles: 1991--Report 4.
INSTITUTION	Florida State Postsecondary Education Planning Commission, Tallahassee.
PUB DATE	21 Feb 91
NOTE	102p.
PUB TYPE	Reports - Descriptive (141)
EDRS PRICE	MF01/PC05 Plus Postage.
DESCRIPTORS	*Certification; Continuing Education; Curriculum; Data Collection; Educational Needs; Educational Planning; *Educational Policy; *Health Occupations; Higher Education; *Labor Market; Labor Needs; Labor Supply; Minority Groups; Occupational Information; Postsecondary Education; *Professional Education; School Business Relationship; State Programs; Student Financial Aid; Tuition
IDENTIFIERS	*Florida

ABSTRACT

This state-mandated report reviews the status of health professions education programs in Florida. Part 1 provides an overview of health professions education policy by describing special considerations for policymakers and program planning, reviewing outcomes of previous Florida Postsecondary Education Planning Commission recommendations, and identifying issues and recommendations pertaining to health professions education. These issues include data collection, labor market supply and demand, minority participation, tuition and financial aid, curriculum, and coordination with the health care delivery system and government. Part 2 provides data profiles on selected health professions education programs. The profiles cover medical education, chiropractic education, dental education, veterinary medicine, pharmacy, public health education, nursing education, physician assistant education, physical therapy and occupational therapy education, and dental auxiliaries. Each profile describes education requirements, licensure and continuing education, and supply and demand factors. (30 references) (JDD)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED 329 195

PEPC

FLORIDA HEALTH PROFESSIONS EDUCATION PROFILES

HE024311

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY
Florida Postsecondary
Educ. Planning Comm
TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
☑ ~~This~~ document has been reproduced as received from the person or organization originating it.
☐ Minor changes have been made to improve reproduction quality
- Points of view or opinions stated in this document do not necessarily represent official OERI position or policy

Report and Recommendations of the Postsecondary Education Planning Commission

1991 - REPORT 4

BEST COPY AVAILABLE

CS6-0350S

POSTSECONDARY EDUCATION PLANNING COMMISSION

Robert G. Kerrigan, Chairman
Pensacola

Alan G. Fickett
Haines City

Thomas A. Heath
Auburndale

Ralph Hogges
Miami

Donald P. Kahn
Coral Gables

Robert B. Mautz
Gainesville

Tully Patrowicz
Mount Dora

Robert G. Stern
Gainesville

James M. Talley
Tallahassee

Robert M. Taylor
Fort Myers

Carolyn M. Wilson
Odessa

William B. Proctor, Executive Director

The Postsecondary Education Planning Commission, initially created by executive order in 1980 and subsequently given statutory authority (SS 240.145 and 240.147, Florida Statutes), serves as an advisory body to the State Board of Education on all postsecondary education matters. The Commission is composed of 11 members of the general public and one full-time student registered at a postsecondary education institution in Florida. Members are appointed by the Governor with the approval of three members of the State Board of Education and subject to confirmation by the Senate.

The major responsibility of the Commission is preparing and updating every five years a master plan for postsecondary education. The enabling legislation provides that the Plan "shall include consideration of the promotion of quality, fundamental educational goals, programmatic access, needs for remedial education, regional and state economic development, international education programs, demographic patterns, student demand for programs, needs of particular subgroups of the population, implementation of innovative educational techniques and technology, and the requirements of the labor market. The capacity of existing programs, in both public and independent institutions, to respond to identified needs shall be evaluated and a plan shall be developed to respond efficiently to unmet needs."

Other responsibilities include recommending to the State Board of Education program contracts with independent institutions; advising the State Board regarding the need for and location of new programs, branch campuses and centers of public postsecondary education institutions; reviewing public postsecondary education budget requests for compliance with the State Master Plan; and periodically evaluating the State's 28 regional coordinating councils for vocational education and adult general education.

Further information about the Commission, its publications, meetings and other activities may be obtained from the Commission office, 231 Collins Building, Department of Education, Tallahassee, Florida, 32399-0400; telephone (904) 488-7894.

POSTSECONDARY EDUCATION PLANNING COMMISSION

FLORIDA HEALTH PROFESSIONS EDUCATION PROFILES

Prepared in Response to Specific Appropriation 634B
of the
1990 General Appropriation Act
Chapter 90-209, Laws of Florida

1991 - Report 4

February 21, 1991

TABLE OF CONTENTS

EXECUTIVE SUMMARY..i

PART ONE: HEALTH PROFESSIONS EDUCATION POLICY

I. INTRODUCTION..1

II. SPECIAL CONSIDERATIONS IN HEALTH PROFESSIONS EDUCATION.........3

Data Collection
Labor Market: Supply and Demand
Minority Participation
Tuition and Financial Aid
Curriculum
Coordination with the Health Care Delivery System and Government
Summary

III. ISSUES AND RECOMMENDATIONS.......................................11

Data Collection
Labor Market: Supply and Demand
Minority Participation
Curriculum
Coordination with the Health Care Delivery System and Government

PART TWO: HEALTH PROFESSIONS EDUCATION DATA PROFILES

IV. COMPILATION OF HEALTH PROFESSIONS DATA PROFILES...............17

V. MEDICAL EDUCATION..21

Education
Licensure and Continuing Education
Labor Market: Supply and Demand

VI. CHIROPRACTIC EDUCATION...29

Education
Licensure and Continuing Education
Labor Market: Supply and Demand

VII. DENTAL EDUCATION..32

Education
Licensure and Continuing Education
Labor Market: Supply and Demand

VIII. VETERINARY MEDICINE....................39

Education
Licensure and Continuing Education
Labor Market: Supply and Demand

IX. PHARMACY....................45

Education
Licensure and Continuing Education
Labor Market: Supply and Demand

X. PUBLIC HEALTH EDUCATION....................52

Education
Licensure and Continuing Education
Labor Market: Supply and Demand

XI. NURSING EDUCATION....................57

Education
Licensure and Continuing Education
Labor Market: Supply and Demand

XII. PHYSICIAN ASSISTANT EDUCATION....................68

Education
Licensure and Continuing Education
Labor Market: Supply and Demand

XIII. PHYSICAL THERAPY AND OCCUPATIONAL THERAPY EDUCATION....................71

Education
Licensure and Continuing Education
Labor Market: Supply and Demand

XIV. DENTAL AUXILIARIES....................76

Education
Licensure and Continuing Education
Labor Market: Supply and Demand

REFERENCES

LIST OF TABLES AND FIGURES

TABLE PAGE

1 GRADUATES FROM HEALTH PROFESSIONS PROGRAMS IN FLORIDA, 1989-90.........18

2 LABOR MARKET: SUPPLY AND DEMAND PROJECTIONS FOR SELECTED HEALTH PROFESSIONS..19

3 FLORIDA AND NATIONAL FIRST-YEAR MEDICAL EDUCATION ENROLLMENTS: TOTAL NUMBERS AND PERCENTAGE BREAKDOWN FOR WOMEN, BLACKS, AND HISPANICS, FALL 1987 TO FALL 1989...24

4 STATE UNIVERSITY SYSTEM COLLEGES OF MEDICINE, TOTAL PREDOCTORAL ENROLLMENTS BY GENDER AND RACE/ETHNICITY, FALL 1987 TO FALL 1989.......25

5 FLORIDA STATE UNIVERSITY PROGRAM IN MEDICAL SCIENCES, FIRST-YEAR ENROLLMENTS BY GENDER AND RACE/ETHNICITY, FALL 1987 TO FALL 1989.......26

6 STATE UNIVERSITY SYSTEM COLLEGES OF MEDICINE, DEGREES GRANTED BY GENDER AND RACE/ETHNICITY, 1987-88 TO 1989-90..........................26

7 NATIONAL FIRST-YEAR ENROLLMENTS AND GRADUATES FOR SCHOOLS OF DENTISTRY: TOTAL NUMBERS AND PERCENTAGE BREAKDOWN FOR WOMEN, BLACKS, AND HISPANICS, 1985 AND 1989...35

8 UNIVERSITY OF FLORIDA COLLEGE OF DENTISTRY, TOTAL PREDOCTORAL ENROLLMENTS BY GENDER AND RACE/ETHNICITY, FALL 1987 TO FALL 1989.......36

9 UNIVERSITY OF FLORIDA COLLEGE OF DENTISTRY, DEGREES GRANTED BY GENDER AND RACE/ETHNICITY, 1987-88 TO 1989-90..........................37

10 NATIONAL ENROLLMENTS AND DEGREES GRANTED IN VETERINARY MEDICINE: NUMBERS AND PERCENTAGE BREAKDOWN FOR WOMEN, BLACKS, AND HISPANICS, 1989...40

11 UNIVERSITY OF FLORIDA COLLEGE OF VETERINARY MEDICINE, TOTAL PREDOCTORAL ENROLLMENTS BY GENDER AND RACE/ETHNICITY, FALL 1987 TO FALL 1989...42

12 UNIVERSITY OF FLORIDA COLLEGE OF VETERINARY MEDICINE, DEGREES GRANTED BY GENDER AND RACE/ETHNICITY, 1987-88 TO 1989-90......................43

13 TOTAL ENROLLMENTS IN ENTRY LEVEL PHARMACY DEGREE PROGRAMS IN THE UNITED STATES: TOTAL NUMBERS AND PERCENTAGE BREAKDOWN BY SEX AND RACE, 1985-86 AND 1987-88..46

14 STATE UNIVERSITY SYSTEM COLLEGES OF PHARMACY, TOTAL UPPER LEVEL BACCALAUREATE ENROLLMENTS BY GENDER AND RACE/ETHNICITY, FALL 1987 TO FALL 1989...48

15 STATE UNIVERSITY SYSTEM COLLEGES OF PHARMACY, TOTAL PHARM.D. ENROLLMENTS BY GENDER AND RACE/ETHNICITY, FALL 1987 TO FALL 1989.......48

16 STATE UNIVERSITY SYSTEM COLLEGES OF PHARMACY, BACCALAUREATE DEGREES GRANTED BY GENDER AND RACE/ETHNICITY, 1987-88 TO 1989-90...............49

LIST OF TABLES AND FIGURES (CONT.)

17 STATE UNIVERSITY SYSTEM COLLEGES OF PHARMACY, PHARM.D. DEGREES GRANTED BY GENDER AND RACE/ETHNICITY, 1987-88 TO 1989-90........................49

18 STATE UNIVERSITY SYSTEM PUBLIC HEALTH PROGRAMS, TOTAL MASTER LEVEL ENROLLMENTS BY GENDER AND RACE/ETHNICITY, FALL 1987 TO FALL 1989.......54

19 STATE UNIVERSITY SYSTEM PUBLIC HEALTH PROGRAMS, MASTER DEGREES GRANTED BY GENDER AND RACE/ETHNICITY, 1987-88 TO 1989-90........................55

20 STATE UNIVERSITY SYSTEM REGISTERED NURSING PROGRAMS, TOTAL UPPER LEVEL BACCALAUREATE ENROLLMENTS BY GENDER AND RACE/ETHNICITY, FALL 1987 TO FALL 1989..59

21 FLORIDA PUBLIC COMMUNITY COLLEGE REGISTERED NURSING PROGRAMS, TOTAL ENROLLMENTS AND DEGREES GRANTED BY GENDER AND RACE/ETHNICITY, 1987-88 TO 1989-90...60

22 STATE UNIVERSITY SYSTEM REGISTERED NURSING PROGRAMS, BACCALAUREATE DEGREES GRANTED BY GENDER AND RACE/ETHNICITY, 1987-88 TO 1989-90.......61

23 FLORIDA PUBLIC COMMUNITY COLLEGE PRACTICAL NURSING PROGRAMS, TOTAL CERTIFICATE AND DIPLOMA ENROLLMENTS AND COMPLETIONS BY GENDER AND RACE/ETHNICITY, 1987-88 TO 1989-90.......................................62

24 FLORIDA DISTRICT VOCATIONAL CENTER PRACTICAL NURSING PROGRAMS, TOTAL CERTIFICATE AND DIPLOMA PROGRAM ENROLLMENTS AND COMPLETIONS BY GENDER AND RACE/ETHNICITY, 1987-88 TO 1989-90...................................63

25 FLORIDA PUBLIC COMMUNITY COLLEGE NURSE ASSISTING PROGRAMS, TOTAL CERTIFICATE PROGRAM ENROLLMENTS AND COMPLETIONS BY GENDER AND RACE/ETHNICITY, 1987-88 TO 1989-90.......................................64

26 FLORIDA DISTRICT VOCATIONAL CENTER NURSE ASSISTING PROGRAMS, TOTAL CERTIFICATE PROGRAM ENROLLMENTS AND COMPLETIONS BY GENDER AND RACE/ETHNICITY, 1987-88 TO 1989-90.......................................65

27 UNIVERSITY OF FLORIDA PHYSICIAN ASSISTING PROGRAM, TOTAL UPPER LEVEL BACCALAUREATE ENROLLMENTS, FALL 1987 TO FALL 1989.....................69

28 UNIVERSITY OF FLORIDA PHYSICIAN ASSISTING PROGRAM, BACCALAUREATE DEGREES GRANTED BY GENDER AND RACE/ETHNICITY, 1987-88 TO 1989-90.......69

29 STATE UNIVERSITY SYSTEM PHYSICAL THERAPY PROGRAMS, TOTAL UPPER LEVEL BACCALAUREATE ENROLLMENTS BY GENDER AND RACE/ETHNICITY, FALL 1987 TO FALL 1989..72

30 STATE UNIVERSITY SYSTEM PHYSICAL THERAPY PROGRAMS, BACCALAUREATE DEGREES GRANTED BY GENDER AND RACE/ETHNICITY, 1987-88 TO 1989-90.......73

31 STATE UNIVERSITY SYSTEM OCCUPATIONAL THERAPY PROGRAMS, TOTAL UPPER LEVEL BACCALAUREATE ENROLLMENTS BY GENDER AND RACE/ETHNICITY, FALL 1987 TO FALL 1989..74

LIST OF TABLES AND FIGURES (CONT.)

32 STATE UNIVERSITY SYSTEM OCCUPATIONAL THERAPY PROGRAMS, BACCALAUREATE DEGREES GRANTED BY GENDER AND RACE/ETHNICITY, 1987-88 TO 1989-90.......74

33 COMMUNITY COLLEGE DENTAL HYGIENE PROGRAMS, TOTAL ENROLLMENTS AND ASSOCIATE OF SCIENCE DEGREES GRANTED BY GENDER AND RACE/ETHNICITY, 1987-88 TO 1989-90...77

34 FLORIDA DISTRICT VOCATIONAL CENTER DENTAL ASSISTING PROGRAMS, TOTAL CERTIFICATE PROGRAM ENROLLMENTS AND COMPLETIONS BY GENDER AND RACE/ETHNICITY, 1987-88 TO 1989-90......................................78

FIGURE

1 PROGRAM DATA ANALYSIS MODEL FLOW CHART FOR ALLIED HEALTH DATA...........4

EXECUTIVE SUMMARY

In proviso language accompanying Specific Appropriation 634B of the 1990 General Appropriations Act, the Postsecondary Education Planning Commission was directed to:

> continue to review the status of all health professions education programs included in the Comprehensive Health Professions Education Plan by developing a health professions education data profile providing educational and workforce data with analysis on the individual health professions. The data profile shall be prepared with the assistance of the educational governing and coordinating boards as well as other appropriate state agencies and shall include data concerning enrollments, graduations, minority participation, licensure, in-migration, continuing education, and market demand.

The Commission will submit its findings and recommendations to the Legislature on or before March 1, 1991.

To direct this study, the Commission Chairman appointed a Program Committee consisting of Commission members Alan Fickett, Chairman; Ralph Hogges; Donald Kahn; and James Talley. The Committee held seven public meetings at which time information was presented on past health professions studies conducted by the Commission, national and state labor market projections, and the status of individual health professions education areas in Florida. Among the entities that assisted during the development of this study were representatives of the Division of Universities, Division of Community Colleges, Division of Vocational, Adult, and Community Education, State Board of Independent Colleges and Universities, Department of Health and Rehabilitative Services, Department of Professional Regulation, professional associations, and various postsecondary institutions.

The **1989 Florida Health Care Atlas** describes Florida as having unique population characteristics compared to other states and the nation as a whole. In contrast to the nation as a whole, Florida's population includes a larger percentage of older adults, many immigrants and descendants of immigrants, an increasing portion of members of other racial and ethnic groups, large numbers of seasonal residents, migrant workers with nomadic lifestyles, and geographic variation in the distribution of these population groups. These demographic characteristics are not only concerns to the health care system but also to the education programs preparing health care practitioners.

In the 1982 **Master Plan for Florida Postsecondary Education**, the Commission recognized the considerable importance of health professions education programs and stated that such programs require separate and independent analysis of needs, student demand, cost, and coordination. Since 1982, the Commission has examined health professions education in Florida and the social and economic forces affecting the supply of and demand for health professionals in the State. Commission reports included the **Health Professions Report** (1983), the **Comprehensive Health Professions Plan Review for Florida** (1988), and reports on the individual health professions. These included nursing (1983 and 1988), public health (1983 and 1989), dentistry (1984 and 1989), chiropractic education (1984), medical education (1985), allied health (1986), pharmacy (1987), and veterinary medicine (1987). The current study examines health professions education programs in Florida by providing both an overview of health professions education policy and data profiles on selected health professions education programs.

The review of former studies of major health professions education areas presented a number of issues that have repeatedly been identified as concerns important to educators and state policymakers. These concerns have been summarized into the following interrelated areas: data collection, the labor market, minority participation, curriculum, and coordination with the delivery system and government.

Data Collection

The accurate and timely collection of data is important to state policymakers in planning interventions to address the health needs of the State through quality educational programs and efficient expenditure of limited resources. Decision making for each of the other areas of concern--labor market, aid, curriculum, and coordination with the delivery system and government--is also enhanced by the availability of pertinent information. The collection of accurate data in a timely manner is costly and requires coordination among the providers and users of information to ensure an efficient and useful product. Although data collection and accessibility have improved in recent years, the ability of policymakers and program planners to have ready access to comparable data, collected by the various entities, remains problematic. In addition, some data important to labor market analyses are not currently being collected or maintained.

For the past three years, the Department of Health and Rehabilitative Services, Office of Comprehensive Health Planning, and the Allied Health Articulation Task Force, which is under the Department of Education's Articulation Coordinating Committee and is composed of representatives from the education sectors, government, regulatory bodies, and industry, have cooperatively designed an information model for the allied health professions. Further efforts to improve the accessibility and compatibility of data appear to depend on: (1) refining the manner in which each entity collects and stores data and adding any data elements currently not collected, and (2) coordinating the flow of information across existing data bases to improve the capacity of various state and regional entities to analyze and report educational and labor market conditions and needs. The Commission is cognizant of current fiscal restraints yet believes that effective state policymaking is dependent on accurate information on current conditions and future projections for tracking health professions education needs.

Labor Market: Supply and Demand

Labor market supply of and demand for health practitioners encompass present levels and geographic distribution of practitioners, licensure and regulation of the professions, sources of new practitioners, and the health care needs of the State. The number of programs for each profession and provisions of geographic access need to be kept in constant balance with efficient use of financial resources. Maintaining a balance between the supply of and demand for health professionals in the State is complicated by both the varied entities involved (education, regulatory bodies, and industry) as well as consideration of regional requirements and in-migration. Data concerning enrollment and graduation trends and supply and demand projections are analyzed in the health professions education profiles in Part Two of this report and are summarized in Tables 1 and 2.

When considering the numbers of graduates from Florida health professions education programs, numbers and trends of new licenses issued annually, and projected average annual openings for practitioners, analyses suggest that the supply of health practitioners, including Florida graduates and in-migration, will be adequate to meet projected demand through the 1990s in the areas of medicine, chiropractic, dentistry, veterinary medicine, pharmacy, occupational therapy, dental hygiene, and dental assisting. Work force analyses suggest, however, that the supply of health practitioners may not be adequate to meet projected demand in public health, nursing, physician assisting, and physical therapy. Regardless of analyses suggesting adequacy of supply, all health professions areas experience geographic maldistribution of practitioners resulting in inadequate health care delivery to rural areas with low economic conditions. The ever-present problem of maldistribution of health practitioners requires innovative programs to increase access to placebound residents in underserved areas.

TABLE 1

GRADUATES FROM HEALTH PROFESSIONS PROGRAMS IN FLORIDA 1989-90

	PUBLIC PROGRAMS					
HEALTH PROFESSIONS PROGRAMS	TOTAL #	% WOMEN	% BLACK	% HISPANIC	INDEPENDENT PROGRAMS TOTAL #	STATEWIDE TOTAL #
Medical Education-Total	--	--	--	--	--	449
Allopathic	209	35.0	5.3	7.2	148	357
Osteopathic	--	--	--	--	92	92
Dental Education	67	36.0	6.0	20.9	--	67
Veterinary Medicine Education	74	55.4	2.7	8.1	--	74
Pharmacy Education	146	60.3	27.4	6.7	30	176
Public Health	58	70.7	8.6	6.9	16	74
Registered Nursing	2,734	91.1	11.0	5.9	339	3,073
Licensed Practical Nursing	1,543	90.5	25.1	2.9	--	1,543
Nurse Assisting	2,122	92.5	38.0	8.9	--	2,122
Physician Assisting	29	62.1	3.4	3.4	--	29
Physical Therapy	110	77.3	2.7	8.2	38	148
Occupational Therapy	60	90.0	1.7	16.7	--	60
Dental Hygiene	225	100.0	1.8	6.2	--	225
Dental Assisting	120	98.3	12.5	6.7	--	120

Sources: Board of Regents; State Board of Community Colleges; Division of Vocational, Adult, and Community Education; State Board of Independent Colleges and Universities; and independent institution reports; 1990.

TABLE 2

LABOR MARKET: SUPPLY AND DEMAND PROJECTIONS FOR SELECTED HEALTH PROFESSIONS

HEALTH PROFESSIONS	TOTAL # ACTIVE LICENSES IN FL 1/1/90[a]	NUMBER PER 100,000 POPULATION IN FL 1988[b]	NUMBER PER 100,000 POPULATION IN U.S. 1988[c]	PROJECTED PERCENTAGE INCREASES, FLORIDA 1987-2000[d]	PROJECTED PERCENTAGE INCREASES, U.S. 1988-2000[e]	AVERAGE ANNUAL OPENINGS, FLORIDA 1987-2000[d]	APPROXIMATE NUMBER OF FLORIDA GRADUATES 1989-90[f]
Physicians	----	----	----	41.7	28	2,763	449
Allopathic	25,763	229.3	237	----	----	-----	357
Osteopathic	1,638	13.4	----	----	----	-----	92
Chiropathic	2,686	22.9	15.8	----	----	-----	----
Dentists	6,769	56.5	58	36.2	13	626	67
Veterinarians	-----	----	19.2	58.8	20.7	164	74
Pharmacists	9,776	76.0	63.8	45.9	27	1,013	176
Public Health	-----	----	----	----	----	-----	74
Registered Nurses	106,432	881.4	670	67.6	39	7,517	3,073
Licensed Practical Nurses	43,561	352.5	----	78.8	37	4,052	1,543
Nursing Assistants	-----	----	----	83.3	32	5,212	2,122
Physician Assistants	718	6.6	----	58.3	28	169	29
Physical Therapists	4,476	----	----	91.3	57	262	148
Occupational Therapists	1,847	----	----	73.8	49	93	60
Dental Hygienists	4,962	----	----	60.1	18	301	225
Dental Assistants	----	----	----	59.1	19	409	120

Sources: a. HRS Office of Comprehensive Health Planning, 1990.
b. HRS Office of Comprehensive Health Planning, 1989.
c. **Seventh Report of the President and Congress on the Status of Health Personnel in the United States** (1990).
d. Florida Department of Labor and Employment Security, Bureau of Labor Market Information, 1990.
e. U.S. Department of Labor, Bureau of Labor Statistics, 1990.
f. Board of Regents, State Board Community Colleges; Division of Vocational, Adult, and Community Education; State Board of Independent Colleges and Universities; and individual institution reports; 1990.

Education, industry, and regulatory entities need to work in conjunction to maintain a balance between the supply of and demand for health practitioners in the State. The Commission believes that, as the State continues to increase in population and in its demands for health care and as its system of postsecondary education continues to develop, enrollment increases and program expansions in selected health areas and geographic regions may be needed to help maintain a balance in the supply and demand of health practitioners. As these programs typically require high start-up and operation costs, state funds could be earmarked to assist in enrollment increases and program expansions.

Minority Participation

The need to increase participation and retention of minority students in health professions education programs has been a concern expressed in each report and continues to be viewed as a priority in efforts to better serve the health needs of a culturally diverse state. A number of programs have been implemented to address former recommendations focused on increasing the supply of minority health practitioners through increasing minority enrollments and retention to graduation. Although increases in the number and percentage of minority students and graduates have been recorded since the early 1980s and participation rates of Florida are comparable to national rates, the number and percentage of minorities enrolled in and graduating from the majority of health professions programs in the State remain low compared to proportions represented in the state's population (approximately 14 percent black and 12 percent Hispanic) (Table 1). In light of the magnitude of the challenge to increase minority participation in health professions education programs, successful efforts by individual institutions to reach social access goals in degrees granted warrant recognition and reward.

Curriculum

Concerns with the curricula of health professions education programs include interest in articulation and career laddering. Associate of science (A.S.) degree programs have not generally articulated easily to bachelor in science (B.S.) degree programs. Educators in the fields of nursing and allied health have sought to address unmet employer demand, practitioner dissatisfaction with career advancement opportunities, and high turnover of the work force by minimizing impediments to articulation without lessening program quality. Adoption of discipline-specific articulation agreements will enhance career laddering, encourage retention in the field, and advance practitioners to levels where demand may be greater, and thus address some of the labor market concerns in the State.

Coordination with the Health Care Delivery System and Government

Lastly, coordination of health professions education programs with government and the health care delivery system was cited as a concern in many of the reports reviewed. Not only was such coordination recommended to improve educational preparedness but also to form cost efficient joint programming and to enhance research efforts of faculty in determining the health care needs of the State. The Statewide Health Council collaborated with the Commission in forming the Coalition of Industry, Education, and Government for Health Related Issues to foster collaborative dialogue on health. The Coalition could expand its goals beyond sharing information and improving health preparation programs to identifying financial resources and planning innovative projects such as evaluating model articulation or cross-training programs, improving educational access to underserved areas and to underrepresented population groups, designing strategies to encourage former health practitioners to return to practice, or supporting magnet schools with an emphasis on health professions programs.

Summary

Planning for the education of health care practitioners to meet the needs of a growing and changing state involves coordination among education, government, regulatory bodies, and health care providers and the integration and application of data concerning enrollments, graduations, minority participation, licensure, in-migration, continuing education, and the labor market. Data profiles for each profession provide policymakers with information on current conditions as well as projections to plan for the future health professions education needs of the State. As a result of the findings presented above, the Commission submits the following recommendations:

Recommendations:

1. **The Department of Health and Rehabilitative Services should coordinate and continue the implementation of the health professions information model designed through the collaborative efforts of the Office of Comprehensive Health Planning and the Allied Health Articulation Task Force.** The State Center for Health Statistics, established pursuant to Section 681.0612, Florida Statutes, could serve as the focal point for this effort. Funding should be phased-in according to available fiscal resources.

2. **The Department of Professional Regulation should refine the collection of data concerning licensed resident health professionals to include a count of those who in-migrate each year and should maintain historical files of their licensure data.**

3. **The Division of Vocational, Adult, and Community Education should routinely report data concerning the sex and race/ethnicity of program completers in a manner comparable to enrollment reports.**

4. **The Division of Universities, Division of Community Colleges, and Division of Vocational, Adult, and Community Education should utilize supply and demand information as an important element in program reviews of health professions education programs.** To improve the balance between supply and demand, enrollment increases or program expansions should target health professions where labor market requirements are not being met, such as in public health, nursing, physician assisting, and physical therapy, or geographic areas where access to health professions education programs is limited. The Commission encourages collaboration in the use of resources among the educational institutions and health care providers to meet the mutual needs of the region.

5. **As part of the state budgetary process, incentive funding to reward social access (equal access/equal opportunity) goals in degrees granted should target programs to increase minority representation in the health professions.**

6. **Individual postsecondary institutions should be actively involved in the development and implementation of statewide discipline-specific articulation agreements for health professions programs.** The Articulation Coordinating Committee and the nursing and allied health fields that have designed current discipline-specific agreements should be commmended. Health fields with the potential to develop future discipline-specific agreements include pharmacy, occupational therapy, and physical therapy.

7. **The Coalition for Industry, Education, and Government for Health Related Issues should expand its goals to include identifying public and private financial resources and planning innovative projects to address improving the accessibility and effectiveness of health professions education programs in meeting the health care needs of the State.**

PART ONE:

HEALTH PROFESSIONS EDUCATION POLICY

I. INTRODUCTION

In proviso language accompanying Specific Appropriation 634B of the 1990 General Appropriations Act, the Postsecondary Education Planning Commission was directed to:

> continue to review the status of all health professions education programs included in the Comprehensive Health Professions Education Plan by developing a health professions education data profile providing educational and workforce data with analysis on the individual health professions. The data profile shall be prepared with the assistance of the educational governing and coordinating boards as well as other appropriate state agencies and shall include data concerning enrollments, graduations, minority participation, licensure, in-migration, continuing education, and market demand.

The Commission will submit its findings and recommendations to the Legislature on or before March 1, 1991.

To direct this study, the Commission Chairman appointed a Program Committee consisting of Commission members Alan Fickett, Chairman; Ralph Hogges; Donald Kahn; and James Talley. The Committee held seven public meetings at which time information was presented on past health professions studies conducted by the Commission, national and state labor market projections, and the status of individual health professions education areas in Florida. Among the entities that assisted during the development of this study were representatives of the Division of Universities, Division of Community Colleges, Division of Vocational, Adult, and Community Education, State Board of Independent Colleges and Universities, Department of Health and Rehabilitative Services, Department of Professional Regulation, professional associations, and various postsecondary institutions.

The **1989 Florida Health Care Atlas** describes Florida as having unique population characteristics compared to other states and the nation as a whole. Since 1950, the population of Florida has increased from 2.8 million to over 13 million in 1990; in other words, the population has increased by more than 360 percent over the last 40 years. In contrast to the nation as a whole, Florida's population includes a larger percentage of older adults, many immigrants and descendants of immigrants, an increasing portion of members of other racial and ethnic groups, large numbers of seasonal residents, migrant workers with nomadic lifestyles, and geographic variation in the distribution of these population groups. As a consequence of these population characteristics, the Atlas identifies four major demographic features of concern to the health care system in Florida: (1) the health care system must respond to the needs of the rapidly expanding elderly population, (2) must be able to accommodate the needs of the resident alien and migrant farmworker populations, (3) must provide services for the medically indigent population, and (4) must overcome a whole spectrum of problems associated with environmental pollution and over-population in many areas of the State. The identified demographic features are not only concerns to the health care system but also to the education programs preparing health care practitioners.

Planning for the education of health care practitioners to meet the needs of a growing and changing state involves the integration and application of data concerning enrollments, graduations, minority participation, licensure, in-migration, continuing education, and labor market demand. Data profiles for each profession provide policymakers with information to plan for the future health professions education needs of the State. Data profiles developed during this study include information on current conditions as well as future projections. The synthesis of current conditions and projections aids in the identification of issues important to policy development and distribution of financial resources for both individual fields and across all health professions education programs.

The State's concern for comprehensive, long-range planning for health professions education is evident in reports that pre-date the Commission's role. Early in the 1940s, Governor Millard Caldwell commissioned the first study of education in Florida, **Education and the Future of Florida: A Report of the Comprehensive Study of Education in Florida** (1947). A chapter in this study was devoted to education in medicine, dentistry, pharmacy, and nursing. In 1957, **Higher Education and Florida's Future,** the first statewide study that focused solely on higher education, was issued. This report included a volume on professional and specialized programs where nursing and pharmacy education were reviewed. In the 1982 **Master Plan for Florida Postsecondary Education,** the Commission recognized the considerable importance of health professions education programs and stated that such programs require separate and independent analysis of needs, student demand, cost, and coordination. Since 1982, the Commission has examined health professions education in Florida and the social and economic forces affecting the supply of and demand for health professionals in the State. The analysis of data and identification of policy issues in the Commission's studies have been useful in educational program planning at both the institutional and state level. Subsequent Commission reports include the **Health Professions Report** (1983), the **Comprehensive Health Professions Plan Review for Florida** (1988), and reports on the individual health professions. Summaries of these reports are included in the profiles section of this report.

This study examines health professions education programs in Florida. Part One provides an overview of health professions education policy by describing special considerations for policymakers and program planning, reviewing outcomes following previous Commission recommendations, and identifying issues and recommendations pertaining to health professions education in the State. Part Two provides data profiles on selected health professions education programs. The profiles serve as supporting data for the policy review in Part One as well as a resource for decision making concerning health professions education in Florida.

II. SPECIAL CONSIDERATIONS IN HEALTH PROFESSIONS EDUCATION

During the course of developing the profiles, several considerations important to health professions education planning and policymaking were identified. These special considerations included concerns that had been addressed in earlier health professions education studies conducted by the Commission, or recurring concerns, as well as some emerging concerns identified during the current study. The review of former studies of major health professions education areas presented a number of issues that have repeatedly been identified as concerns important to educators and state policymakers. Such considerations are useful in directing an ongoing study of programs and policies in health professions education. Recommendations pertaining to considerations identified in former studies are synthesized in the following sections, and examples of outcomes resulting from those recommendations are described. The outcomes are not necessarily soley the result of Commission recommendations but reflect the impact and efforts of a number of individuals and entities.

These considerations have been summarized into the following interrelated areas: data collection, labor market, minority participation, tuition and financial aid, curriculum, and coordination with the delivery system and government. The **Comprehensive Health Professions Plan Review for Florida** (1988) reported the disposition of former recommendations for each of the eight professions previously studied. Since the 1988 review, a number of studies and program reviews have been completed, which further addressed the issues identified. Additional information concerning each area of consideration identified during the current study is included in the summaries.

Data Collection

The accurate and timely collection of data is important to state policymakers in planning interventions to address the health needs of the State through quality educational programs and efficient expenditure of limited resources. Decision making for each of the other areas of concern--labor market, tuition and financial aid, curriculum, and coordination with the delivery system and government--is also enhanced by the availability of pertinent information. The collection of accurate data in a timely manner is costly and requires coordination among the providers and users of information to ensure an efficient and useful product. Cooperative and coordinated data production reduces duplicative efforts and minimizes the chance of failing to collect data for an essential component.

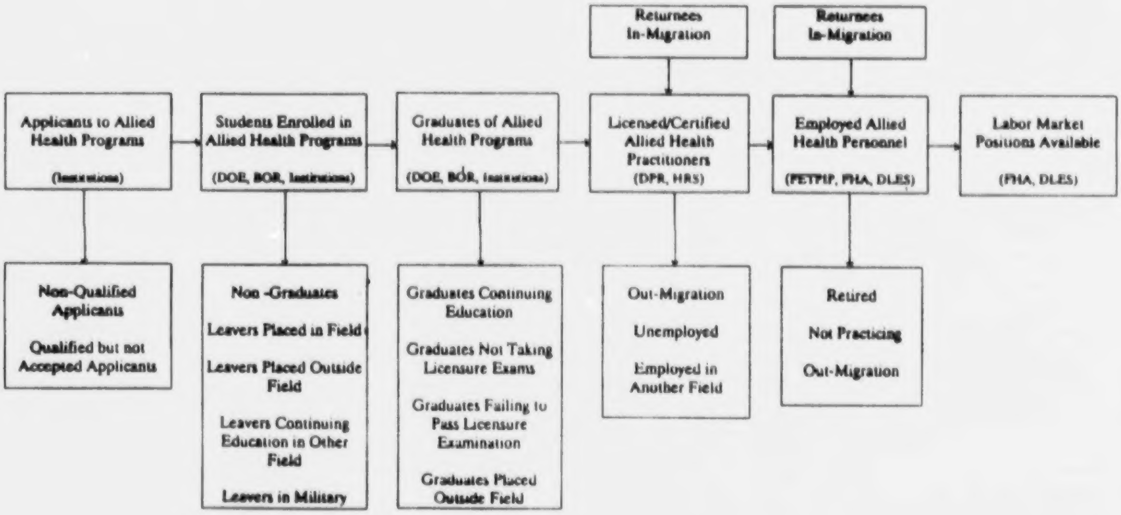
The **Comprehensive Health Professions Plan Review for Florida** (1988) reported on the disposition of a number of former recommendations relating to data collection such as improving the level and quality of data collection for the health professions, improving communication to prospective students concerning program offerings and professional opportunities, and coordinating and funding cooperative efforts of data collectors and users. The report cited a number of actions taken to address former recommendations. For example, in the review of nursing, the Department of Health and Rehabilitative Services, Office of Regulation and Health Facilities, was recognized for providing quality data on health professionals on a regular basis; the Board of Regents, the State Board of Community Colleges, the Division of Vocational, Adult, and Community Education, and the State Board of Independent Colleges and Universities were recognized for providing enrollment and graduation trends; and private associations such as the Florida Health Care Association were also recognized for information made accessible. The review stated that the lack of studies on projecting the demand for nurses remained a major weakness. A continuous program of labor market supply and demand studies was needed. Again in the review of allied health, the report recognized the work of the Department of Health and Rehabilitative Services, Office of Manpower Planning, yet encouraged further cooperative efforts among institutions, state agencies, and private groups.

Data collection has improved in some areas. Since 1986, the Department of Health and Rehabilitative Services, Office of Comprehensive Health Planning, has annually published the **Florida Health Care Atlas**. This series of documents includes information on Florida demographics, health issues, health care work force, and health facilities for the State and its counties. The 1990 Atlas contains a lengthy discussion of the health care labor market including trend data on licensed professions, projected demand through the year 2000, salary information and detailed listings of over 150 health professions with descriptions of the profession, licensure and certification requirements, education and training, and listings of Florida educational institutions offering health training in each field.

In addition to the Atlas, staff members from the HRS Office of Comprehensive Health Planning are working with the Allied Health Articulation Task Force to improve allied health information for program planning and articulation. The Allied Health Articulation Task Force's Subcommittee on Allied Health Data has elicited the cooperation of educational, governmental, regulatory, and professional association entities to systematize the efficient collection and use of data for allied health professions. Through the collaborative efforts of these health professions entities, a model flow chart for allied health was designed for program data analysis (Figure 1).

FIGURE 1

PROGRAM DATA ANALYSIS MODEL FLOW CHART FOR ALLIED HEALTH DATA


Returnees In-Migration
Returnees In-Migration
Applicants to Allied Health Programs (Institutions)
Students Enrolled in Allied Health Programs (DOE, BOR, Institutions)
Graduates of Allied Health Programs (DOE, BOR, Institutions)
Licensed/Certified Allied Health Practitioners (DPR, HRS)
Employed Allied Health Personnel (PETPIP, FHA, DLES)
Labor Market Positions Available (FHA, DLES)
Non-Qualified Applicants
Qualified but not Accepted Applicants
Non -Graduates
Leavers Placed in Field
Leavers Placed Outside Field
Leavers Continuing Education in Other Field
Leavers in Military
Graduates Continuing Education
Graduates Not Taking Licensure Exams
Graduates Failing to Pass Licensure Examination
Graduates Placed Outside Field
Out-Migration
Unemployed
Employed in Another Field
Retired
Not Practicing
Out-Migration

The Department of Professional Regulation has provided licensure information for previous Commission studies and has pledged its cooperation to program review efforts in the health professions areas. Data have also been received for health professions education studies from various professional associations such as the Florida Hospital Association.

In relation to the Commission's former recommendations to improve quality and availability of information for students concerning program offerings and professional opportunities, the report cited progress in the incorporation of information on medical education, allied health, and veterinary education programs into CHOICES (a computerized system of information on careers), the Student Academic Support System (SASS) for students in the State University System, and the Student On-Line Advisement and Articulation system (SOLAR) for the secondary and postsecondary sectors.

Labor Market: Supply and Demand

Labor market supply of and demand for health practitioners encompasses present levels and geographic distribution of practitioners, licensure and regulation of the professions, sources for new practitioners, and the health care needs of the State. The number of programs for each profession and provisions of geographic access need to be kept in constant balance with efficient use of financial resources. The use of supply and demand data becomes integral to the targeted expansion of costly programs.

The **Comprehensive Health Professions Plan Review for Florida** (1988) reported on previous recommendations addressing various aspects of the labor market issue. For example, former recommendations called for maintaining the level of enrollments and number of programs in health professions education programs, except to address targeted needs or geographic areas. The review reported that, although a shortage of specialty nurses such as intensive-care and cardiac-care nurses has continued, programs designed to address this need have been implemented. In addition, growth in the number of graduate-level nursing programs increased the preparation of nurses with master's degrees. Program expansions implemented for public health included a new program at the University of South Florida; a cooperative program between the University of Miami and Florida International University; University of South Florida extension and outreach programs for Sarasota, Orlando, and Tallahassee; and continuing education offered through the Florida satellite network.

Recommendations concerning the maldistribution of dental practitioners were addressed when the University of Florida College of Dentistry established outreach clinics to rural communities and low-income groups and expanded its general practice residencies. State programs in pharmacy, medical, and veterinary education have followed recommendations to maintain enrollment levels, while targeted expansion of access to southeastern Florida for pharmacy education has been addressed by increasing Florida Agricultural and Mechanical University's presence in that area and providing state funding support for students in the College of Pharmacy at Southeastern University of the Health Sciences.

Established in 1971 to capture federal capitation funds, the Program in Medical Sciences (PIMS) at Florida State University was founded to expand the first-year space limitations of the University of Florida's medical program by offering basic science laboratory courses. To increase access to medical education in North Florida, participants are accepted from Florida State University, Florida

Agricultural and Mechanical University, and the University of West Florida. The program places an emphasis on preparation of primary care practitioners, and the proportion of graduates who entered primary care residencies has been higher among students who participated in PIMS than among students who attended the University of Florida during their first year of medical school.

Maintaining a balance between the supply of and demand for health professionals in the State is complicated by both the varied entities involved (education, regulatory bodies, and industry), as well as consideration of regional requirements and in-migration.

Minority Participation

The need to increase participation and retention of minority students in health professions education programs has been a concern expressed in each report and continues to be viewed as a priority in efforts to better serve the health needs of a culturally diverse State. A number of programs have been implemented to address this concern. The University of Florida medical college works with high school counselors and brings sophomore and junior high school students to campus for a health science teach-in. The University of Miami College of Medicine actively recruits at predominantly black colleges in the Southeast and sponsors a four-week summer instructional program for each entering class with the assistance of state funding. The University of Miami also offers an on-campus Health Careers Motivation Program each summer, which is designed to identify, recruit, and select minority students and thus facilitate their entry into health professions programs. Individual allied health programs have utilized student recruiters, mailouts, and visits to high schools to promote their programs, particularly among black and Hispanic groups. Brevard Community College implemented an intensive program in 1984 to increase minority participation in allied health that resulted in minority enrollments increasing from about three percent in 1984 to nine percent in 1986. The University of Florida College of Veterinary Medicine increased minority recruitment efforts and reported in 1988 that it was among the top programs nationally in enrollment of black students and second in the nation in the number of Hispanics enrolled.

Although the number and percentage of college-going minority students have increased since the early 1980s, and participation rates for Florida are comparable to national rates, the number and percentage of minorities enrolled in and graduating from health professions programs in the State remain low. For example, black enrollments in public medical and veterinary programs and Hispanic enrollments in the veterinary program increased, as did graduation rates for Hispanics in the veterinary program and for blacks in public medical programs. On the other hand, Hispanic enrollments declined for dentistry. Black enrollments in dentistry and black graduation rates for dentistry and veterinary medicine fluctuated. In 1988 when the College of Veterinary Medicine ranked high among veterinary programs nationally in enrollment of black and Hispanic students, there were seven black students (2.2%) and 21 Hispanic students (6.7%) enrolled. Women are underrepresented in public programs for medical and dental education, and men are underrepresented in public health, nursing, and allied health fields. Men and women have made gains, however, in the areas where they had been traditionally underrepresented.

Minority participation rates in health professions programs in public institutions are low compared to the proportion represented in the state's population (approximately 14 percent black and 12 percent Hispanic) with the exception of Hispanic graduation rates in dentistry and occupational therapy and black graduation rates in pharmacy, licensed practical nursing, and nurse assisting programs in 1989-90. In 1989-90, less than five percent of the graduating classes for veterinary medicine, physician assisting, physical therapy, occupational therapy, dental hygiene, and dental assisting were black students. For the same year, less than five percent of the graduating classes for licensed practical nursing, nurse assisting, and physician assisting were Hispanic students (Table 1).

Tuition and Financial Aid

The cost of education for students in health professions education programs affects the supply of graduates both in terms of recruitment and retention. Tuition levels are usually set by degree level rather than by cost of the program or demand for graduates; however, the provision of financial aid changes the real cost to the student. Financial aid programs are available from public and private sources and are distributed to students in public, independent, and proprietary institutions. Financial aid can also be targeted toward students enrolled in specific programs or student groups who are underrepresented in the health professions. The awareness and use of financial aid programs need to be monitored to determine their effectiveness in recruitment and retention efforts.

The **Comprehensive Health Professions Plan Review for Florida** (1988) summarized the status of past recommendations concerning tuition levels and financial aid programs to address specific state goals. Some past recommendations called for increases in tuition for professional health programs to levels that would more closely approximate the percentage of costs borne by undergraduate students in the State University System. Average annual tuition and fees have risen for resident medical education students in the State University System from $3052 in 1986-87 to $6202 in 1990-91 ($15,301 for non-resident students).

To address the underrepresentation of blacks and Hispanics in Florida medical schools, the Commission recommended financial aid incentives. Following the recommendation, a budget request was made in 1987-88 to include Hispanics in the Delores A. Auzenne Fellowships, which had been serving black students in first professional programs; however, no additional funds were appropriated by the Legislature, and no Hispanics have received this award thus far. In addition, the Office of Equal Opportunity Programs of the State University System administers the systems's grant-in-aid program, which is designed to aid two full-time equivalent (FTE) employees at each university annually who are enrolled in graduate studies. The program is targeted at women and minorities.

The Legislature established the Medical Education Reimbursement and Loan Repayment Program (Section 240.4067, Florida Statutes) to address the maldistribution of medical professionals in the State and the Commission's concern about the increasing indebtedness of medical students and the negative effects of medical school costs on access for students from minority and disadvantaged families. The program, funded with state and federal funds, makes payments that offset tuition paid by students for studies leading to medical, physician assistant, or nursing degrees or licensure for practicing in a primary care specialty as identified by the Department of Health and Rehabilitative Services. Federal funding for this program was suspended, and, thus, no new applications are being accepted. In addition, the 1989 Legislature established the Nursing Student Loan Forgiveness Program to encourage qualified personnel to seek employment in areas of the State in which critical nursing shortages exist.

This program is funded through an additional fee assessed to new nursing licenses and licenses granted through endorsement for nurses from other states. It is anticipated that initial distribution of funds will be approved for January 1991.

In addition to state and federal programs that address the nursing shortage, most professional associations offer scholarships, grants, and loans. The Florida Hospital Association reported that nursing students enrolled in formal postsecondary education courses also have opportunities to receive scholarships, stipends, grants, and other funds from hospitals. Typically, aid is awarded with an obligation to work for that hospital after graduation for a given amount of time. Also, institutions offer aid to health professions students, which is funded through private sources.

The 1989 Legislature also established a nursing education grant program to increase enrollments in community college nursing and related allied health programs. When matching funds have been raised from the private sector, community colleges may request aid to increase enrollments through such mechanisms as faculty enhancement, learning resources, and recruitment efforts. The 1990 Legislature funded this program with $800,000. Community colleges and state universities reported enrollment increases in registered nursing and licensed practical nursing programs for the past two years.

Curriculum

Concerns with the curricula of health professions education programs have focused on many areas: articulation and career laddering; program level, length, and requirements; interdisciplinary education; and the inclusion of content areas such as geriatrics. Addressing such curriculum concerns involves extensive cooperation and coordination among the education sectors, accrediting and professional boards, licensing boards, the health care delivery system, and state level policymakers.

Articulation, career laddering, and program length, level, and requirements have been the focus of a number of past recommendations for nursing and the allied health fields. The **Comprehensive Health Professions Plan Review for Florida (1988)** stated that articulation for these programs was complicated by the different awards granted, by the various delivery systems providing education and training, and by the large number of different allied health professions. The State has made considerable progress in providing movement through educational programs at different levels and improving upward mobility for many health professionals. The Commission recognized the progress made toward articulation through local level agreements in nursing, program leveling in allied health, and generic articulation agreements for allied health and encouraged further coordination and cooperation among the education sectors to forge new agreements and to strengthen present ones.

Associate in science degrees in nursing and allied health fields were not designed to articulate to baccalaureate degree programs. Improving articulation of associate in science degrees to baccalaureate degrees, however, has been promoted as a means to enhance career laddering and employment retention for traditionally low paying health occupations. Since 1984, the nursing disciplines have had the only targeted articulation agreement specified in statute, although the agreement apparently has not been widely used. Currently, a nursing task force of educators, administrators, and practitioners, which is addressing issues raised in a state-level program review of nursing, has examined the nursing articulation agreement and is expected to reconceptualize the document toward outcomes assessment to make it more responsive to current and projected developments in the nursing profession, as well as in nursing education.

Curricular concerns have been important issues across educational sectors. The Allied Health Articulation Task Force with membership representing the education sectors, government agencies, and private industry and associations has been meeting since spring of 1989 to address needs for data, cross-training, and a core curriculum for the allied health fields. Task force subcommittees focused on articulation in the allied health fields of imaging and medical laboratory science. Articulation and career laddering issues have also received attention in the fields of dental auxiliaries and respiratory technicians and therapists.

Pharmacy, dental, and medical education programs were also examined for curricular issues. Length of degree program options for entry to pharmacy practice was a prominent issue in previous Commission studies. A resulting recommendation was to retain both the five-year baccalaureate and six-year doctor of pharmacy degree programs in the public institutions. Following Commission recommendations concerning research and curriculum content, the University of Florida College of Dentistry strengthened its research component and increased its commitment to the areas of geriatrics and gerontology for both research and course content. The 1988 Commission review also reported that curricula in Florida's medical schools have increasingly incorporated geriatric education through both clinical and didactic exposure. A 1989 report by the Southern Regional Education Board concerning issues and strategies in gerontology education noted that degree or certificate programs were available in gerontology education for nursing, medicine, dentistry, and pharmacy at the University of Florida and the University of South Florida.

The **Master Plan on Aging for Florida**, published by the Florida Pepper Commission on Aging in 1990, identified the need to support geriatric health care education to improve the availability and quality of care for the elderly. The Pepper Commission recommended earmarking funds to enable Florida medical schools to train geriatric physicians and other health care professionals in geriatrics; supporting geriatric education centers training programs, including interdisciplinary training for social workers, counselors, and case managers; identifying and promoting financial support for students in health fields with career interests in geriatrics and gerontology; and supporting efforts to increase the supply of new and returning registered nurses and licensed practical nurses.

Coordination with the Health Care Delivery System and Government

Lastly, coordination of health professions education programs with government and the health care delivery system was cited as a concern in many of the reports reviewed. Not only was such coordination recommended to improve educational preparedness but also to form cost efficient joint programming and to enhance research efforts of faculty in determining the health care needs of the State.

The **Comprehensive Health Professions Plan Review for Florida** (1988) reported on efforts to increase coordination and cooperation among education, government, and industry entities. For example, the report recognized nursing educators and practitioners for improving both the quality and quantity of discussion concerning nursing education competencies for entry into practice. The Commission recognized efforts at the institutional level where deans and directors of Florida allied health programs have been meeting semiannually since 1986 to discuss issues in their area. The Commission suggested that the Statewide Health Council take a leadership position in forming a planning group to foster collaborative dialogue on health professions education at the state level. The resulting group--the Coalition of Industry, Education, and Government for Health Related Issues--met twice in 1989 to discuss health professions issues with emphasis on the health care labor market. Discussions promoted increased awareness of intersector problems and information being collected by each of the entities involved.

Summary

Progress has been made at the institutional and state levels toward implementing many of the Commission's previous recommendations concerning data, the labor market, tuition and financial aid, curriculum, and coordination with the health care delivery system and government. Continued and further efforts are needed, however, to fully implement recommendations in each area. Expanded state-level coordination, support, and funding for data analysis and planning would assist decision makers in setting enrollment levels, targeting program growth, revising curriculum, and establishing effective financial aid programs. Minority student recruitment and retention generally have increased in a number of areas; however, minority participation in health professions education programs remains below the proportional representation of minorities in the general population in Florida. Finally, continued and increased efforts need to be made to meet the demand for health professionals through the combined attempts to increase the number of graduates, encourage retention in the work force, and foster the return and retraining of people who left the health fields.

III. ISSUES AND RECOMMENDATIONS

In response to proviso language in the 1990 General Appropriations Act, the Commission reviewed the status of all health professions education programs included in the Comprehensive Health Professions Education Plan. The review included developing health professions education data profiles that provide educational and work force data with analysis for the individual health professions. The individual health professions profiles in Part Two of this report include data concerning enrollments, graduations, minority participation, licensure, in-migration, continuing education, and the labor market.

Education for health professions in Florida must be viewed within the context of a highly dynamic and complex health care industry. Health professions education is multifaceted and complicated by such concerns as the specific health needs of various population subgroups, external control exerted on academic programs by regulatory entities, changing incidence and patterns of disease, changing health technology, availability of qualified faculty, and the high cost of funding health education programs. Florida's diverse and rapidly growing population presents a tremendous challenge to the state's health care industry, educators, and policymakers. The following sections focus on a number of issues related to education and the labor market for the health professions and provide recommendations to address those issues.

Data Collection

The efficiency and effectiveness of policy development and program planning is dependent on analysis of educational and work force data. Any discussion of educational and work force conditions for the health professions relies on available, comparable information. Previous reports have recognized educational entities, professional associations, and state agencies for improving data collection and making health professions information accessible. The ability of policymakers and program planners to have ready access to comparable data, collected by the various entities, nevertheless, remains problematic. In addition, some data important to labor market analyses are not currently being collected or maintained. For example, the Department of Professional Regulation does not report the number of professionals with active licenses who in-migrate each year, and the Division of Vocational, Adult, and Community Education does not routinely report the sex and race/ethnicity of program completers.

The 1988 Legislature authorized the Department of Health and Rehabilitative Services to establish the State Center for Health Statistics (Section 381.0612, Florida Statutes) for the collection and dissemination of health-related data and statistics, but the collection of data concerning health professions education programs was not specified in statute. Furthermore, the Center has received no state appropriation to date.

For the past three years, the Department of Health and Rehabilitative Services, Office of Comprehensive Health Planning, and the Allied Health Articulation Task Force, which is under the Department of Education's Articulation Coordinating Committee and is composed of representatives from the education sectors, government, regulatory bodies, and industry, have cooperatively designed an information model for the allied health professions. The model provides for the consistent collection of compatible information from existing data bases in education, professional organizations, and industry, and, through its generic design, is applicable to other health professions. The Office of Comprehensive

Health Planning and the Task Force Subcommittee on Data are analyzing the modifications needed in existing data bases, resources required to meet data needs, and administrative placement of a data base clearinghouse necessary to implement the information model. The clearinghouse would provide access to education and labor market data for longitudinal and trend analyses. Development of data profiles for the current Commission study was greatly enhanced by the efforts of the Task Force's Subcommittee on Data.

The Commission continues to emphasize that accessible and compatible data are essential for effective and efficient policymaking and program planning for the health professions. The Commission commends the collaborative efforts of education, government, regulatory, and industry entities to improve the quality and availability of health professions education and labor market information. Further efforts to improve the accessibility and compatibility of data appear to depend on: (1) refining the manner in which each entity collects and stores data and adding any data elements currently not collected, and (2) coordinating the flow of information across existing data bases to improve the capacity of various state and regional entities to analyze and report educational and labor market conditions and needs. The Commission is cognizant of current fiscal restraints yet believes that effective state policymaking is dependent on accurate information on current conditions and future projections for tracking health professions education needs.

Recommendations:

1. **The Department of Health and Rehabilitative Services should coordinate and continue the implemention of the health professions information model designed through the collaborative efforts of the Office of Comprehensive Health Planning and the Allied Health Articulation Task Force.** The State Center for Health Statistics, established pursuant to Section 681.0612, Florida Statutes, could serve as the focal point for this effort. Funding should be phased-in according to available fiscal resources.

2. **The Department of Professional Regulation should refine the collection of data concerning licensed resident health professionals to include a count of those who in-migrate each year and should maintain historical files of their licensure data.**

3. **The Division of Vocational, Adult, and Community Education should routinely report data concerning the sex and race/ethnicity of program completers in a manner comparable to enrollment reports.**

Labor Market: Supply and Demand

Data concerning enrollment and graduation trends and supply and demand projections are analyzed in the health professions education profiles in Part Two and are summarized in Tables 1 and 2. In general, data reported in the profiles concerning graduations from Florida health professions programs between 1987-88 and 1989-90 reveal that the numbers of students graduating have been stable in medical, veterinary, physician assisting, and occupational therapy programs; fluctuating in dental, pharmacy, public health, nurse assisting, and physical therapy programs; and increasing in registered nursing, licensed practical nursing, dental hygiene, and dental assisting programs.

Two observations have been noted concerning the supply of licensed health practitioners in Florida. First, the total numbers of licensed practitioners included in this study are increasing over time. Second, a substantial portion, often a majority, of the increase in licensed practitioners each year is a result of in-migration of health professionals from education programs in other states, rather than graduates from Florida educational institutions. Determining the number of health practitioners that would be adequate to serve the State is problematic due to population demographics and health needs of specific population subgroups. Comparative practitioner-to-population ratios offer a basis for labor market analysis; however, allowances should be made for variance in health care delivery, disease incidence and patterns, and the uneven distribution of health practitioners throughout the population (Table 2).

When considering the numbers of graduates from Florida health professions education programs, numbers and trends of new licenses issued annually, and projected average annual openings for practitioners, analyses suggest that the supply of health practitioners, including Florida graduates and in-migration, will be adequate to meet projected demand through the 1990s in the areas of medicine, chiropractic, dentistry, veterinary medicine, pharmacy, occupational therapy, dental hygiene, and dental assisting. Work force analyses suggest that the supply of health practitioners may not be adequate, however, to meet projected demand in public health, nursing, physician assisting, and physical therapy. Analyses are based on the assumption that, for all health professions, the projected supply remains dependent on continuation of in-migration. In reality, political and economic forces outside Florida may greatly influence the in-migration of health professionals from other states. The Commission cautions against an overdependence on in-migration of health practitioners.

Regardless of analyses suggesting adequacy of supply, all health professions areas experience geographic maldistribution of practitioners resulting in inadequate health care delivery to rural areas with low economic conditions. Education-related efforts to address the maldistribution of practitioners through increasing geographic access to education and health services include the Program in Medical Sciences at Florida State University, Florida Agricultural and Mechanical University's extended presence in Southeast Florida, state funding for students enrolled in selected programs at independent institutions, outreach clinics serving rural communities and low-income groups, and expanded general practice residencies. In addition, a number of financial incentive programs have been established to encourage qualified health professionals to practice in underserved locations. In allied health fields, the concept of cross-training practitioners to develop skills in more than one area has gained support as a means to increase the availability of health care services in rural areas. The presence of health care providers often is more concentrated in areas where health professions education programs exist. The Commission believes that the ever-present problem of maldistribution of health practitioners requires innovative programs to increase access to placebound residents in underserved areas.

Enrollments in Florida health professions education programs are only one element in the complex labor market of supply and demand, which also includes such elements as professional regulation, in-migration, economic and cultural desirability of geographic areas, and employment environment. Health professions education programs are expensive to establish and maintain due in part to equipment needs, changing technologies, and low student-to-faculty ratios required for clinical experiences. In recognition of the high cost of health professions education programs, consideration for program expansion as a means to increase the supply of health practitioners warrants careful examination, and state funds could be earmarked to assist in expansion and enrollment increases. The program review process provides a state-level mechanism for the education sectors to analyze supply and demand information in relation to the provision of health professions education programs.

The Commission believes that education, industry, and regulatory entities need to work in conjunction to maintain a balance between the supply and demand of health practitioners in the State. Education entities can affect that balance by adjusting the supply of new or returning practitioners and increasing access to health professions programs to underserved regions. The Commission believes that, as the State continues to increase in population and in its demands for health care and as its systems of postsecondary education continues to develop, enrollment increases and program expansions in selected health areas and geographic regions may be needed to help maintain a balance in the supply and demand of health practitioners.

Recommendation:

4. **The Division of Universities, Division of Community Colleges, and Division of Vocational, Adult, and Community Education should utilize supply and demand information as an important element in program reviews of health professions education programs.** To improve the balance between supply and demand, enrollment increases or program expansions should target health professions where labor market requirements are not being met, such as in public health, nursing, physician assisting, and physical therapy, or geographic areas where access to health professions education programs is limited. The Commission encourages collaboration in the use of resources among the educational institutions and health care providers to meet the mutual needs of the region.

Minority Participation

For the purposes of this report, the issue of minority participation focuses on enrollment and graduation rates for blacks and Hispanics. A number of programs have been implemented to address former recommendations focused on increasing the supply of minority health practitioners through increasing minority enrollments and retention to graduation. Although increases in the number and percentage of minority students and graduates have been recorded since the early 1980s, and participation rates for Florida are comparable to national rates, the number and percentage of minorities enrolled in and graduating from the majority of health professions programs in the State remain low compared to proportions represented in the state's population (approximately 14 percent black and 12 percent Hispanic). In 1989-90, programs noted for demonstrating strong minority participation rates included dental and occupational therapy programs for graduation rates among Hispanics, and pharmacy, licensed practical nursing, and nurse assisting programs for graduation rates for blacks (Table 1).

In its 1991 study entitled **Student Access to Higher Education**, the Commission acknowledged the importance of enhancing social access to postsecondary education. The study also concluded that success in increasing minority participation in higher education depends not only on individual campuses making fundamental changes but also on state policies creating the climate that makes change possible. The Commission recommended that State Board of Education policy regarding social access should reflect the goals of minority enrollment in public higher education, which is proportional to the minority population of the State, and minority graduation rates, which are comparable to graduation rates of other students. The Commission further recommended that the Legislature should provide incentive funding to reward institutions that reach social access (equal access/equal opportunity) goals in degrees granted. In light of the magnitude of the challenge to increase minority participation in health professions education programs, successful efforts by individual institutions to reach social access goals in degrees granted warrant recognition and reward.

Recommendation:

5. **As part of the state budgetary process, incentive funding to reward social access (equal access/equal opportunity) goals in degrees granted should target programs to increase minority representation in the health professions.**

Curriculum

Educators in the fields of nursing and allied health have sought to address unmet employer demand, practitioner dissatisfaction with career advancement opportunities, and high turnover of the work force by minimizing impediments to articulation without lessening program quality. The associate of science (A.S.) degree programs have not generally articulated easily to the bachelor in science (B.S.) degree programs.

An A.S. to B.S. in nursing articulation agreement has been specified in statute since 1984; however, its use has been limited. The State Board of Community College's task force to conduct the statewide review of nursing programs is currently addressing a variety of concerns raised through the state-level program review process. The task force is revising the articulation agreement to improve its utility by focusing on outcomes assessments. The Allied Health Articulation Task Force subcommittees are working to design articulation agreements for imaging and medical laboratory technology programs. In addition, the allied health programs of dental hygiene and assisting and respiratory therapy and technology have also developed articulation agreements. The Commission believes that adoption of discipline-specific articulation agreements will enhance career laddering, encourage retention in the field, and advance practitioners to levels where demand may be greater, and thus address some of the labor market concerns in the State.

Recommendation:

6. **Individual postsecondary institutions should be actively involved in the development and implementation of statewide discipline-specific articulation agreements for health professions programs.** The Articulation Coordinating Committee and the nursing and allied health fields that have designed current discipline-specific agreements should be commmended.

Health fields with the potential to develop future discipline-specific agreements include pharmacy, occupational therapy, and physical therapy.

Coordination with the Health Care Delivery System and Government

Previous reports on health professions education programs called for increased coordination among education, government, and industry entities to improve educational preparedness, form cost-efficient joint programs, and enhance research efforts of faculty in determining health care needs of the State. In recent years, numerous efforts to increase coordination have been successful. For example, health care providers and regulators have participated in program review activities, in the nursing statewide task force, and in the allied health articulation task force. In addition, the Statewide Health Council collaborated with the Commission in forming the Coalition of Industry, Education, and Government for Health Related Issues to foster collaborative dialogue on health professions education at the state level. During these activities, information concerning health professions education and labor market was shared and collaborative relationships were established. The Coalition is expected to continue meeting periodically. The Coalition could expand its goals beyond sharing information and improving health preparation programs. For example, the Coalition could identify financial resources and plan innovative projects, such as evaluating model articulation or cross-training programs, improving educational access to underserved areas and to underrepresented population groups, designing strategies to encourage former health practitioners to return to practice, or supporting magnet schools with an emphasis on health professions programs.

Recommendation:

7. **The Coalition for Industry, Education, and Government for Health Related Issues should expand its goals to include identifying public and private financial resources and planning innovative projects to address improving the accessibility and effectiveness of health professions education programs in meeting the health care needs of the State.**

PART TWO:

HEALTH PROFESSIONS EDUCATION DATA PROFILES

IV. COMPILATION OF HEALTH PROFESSIONS DATA PROFILES

In proviso language accompanying Specific Appropriation 634B of the General Appropriations Act, the 1990 Legislature directed the Postsecondary Education Planning Commission to "continue to review the status of all health professions education programs included in the Comprehensive Health Professions Education Plan." The proviso specifically requested that the profiles include data concerning enrollments, graduations, minority participation, licensure, in-migration, continuing education, and market demand. Part Two presents data profiles for selected health professions and summary data across the health professions.

Data for the profiles were supplied by the Board of Regents; State Board of Community Colleges; Division of Vocational, Adult, and Community Education; State Board of Independent Colleges and Universities; and individual institutions for enrollments, graduations, and minority participation in Florida education programs. Comparable data for the nation were obtained from the Department of Health and Human Services' 1990 report entitled **Seventh Report to the President and Congress on the Status of Health Personnel in the United States** and from reports published by professional associations. Data concerning licensure and continuing education in Florida were supplied by the Division of Medical Quality Assurance and the individual boards of the Department of Professional Regulation. Labor market and in-migration data were obtained from the 1989 and 1990 editions of the **Florida Health Care Atlas**, the **Seventh Report to the President and Congress on the Status of Health Personnel in the United States**, and the federal Office of Employment Projections, Bureau of Labor Statistics.

Each health profession profile provides educational data concerning enrollments, graduations, and minority participation for the past three years and, where possible, references to data from earlier in the decade to view these data elements over time. The profiles also include data pertaining to labor market supply levels and projected requirements for the health professions until the end of the decade. This chapter provides a compilation of education and labor market data across the health professions.

Table 1 lists selected health professions programs, graduation numbers, and minority participation for the public programs for the most recent academic year. The numbers of students that graduated from programs at independent institutions in the State are also listed and added to the graduates from the public sector programs for a statewide total for 1989-90.

The total number of graduates statewide represents an important element of labor market supply, which, when compared with projected demand, gives an indication of the number of professionals needed from in-migration or through increasing enrollments within the state programs. This supply element--number of Florida graduates--is entered on Table 2. Another supply element listed on Table 2 is the total number of professionals with active licenses in Florida. In addition, Table 2 provides comparisons between the nation and the State for the number of health practitioners per 100,000 population and percentage of increases in positions projected to the end of the decade. The average annual openings projected in Florida between 1987 and 2000 offer further indication of the state's labor market requirements.

TABLE 1

GRADUATES FROM HEALTH PROFESSIONS PROGRAMS IN FLORIDA
1989-90

	PUBLIC PROGRAMS				INDEPENDENT PROGRAMS	STATEWIDE
HEALTH PROFESSIONS PROGRAMS	TOTAL #	% WOMEN	% BLACK	% HISPANIC	TOTAL #	TOTAL #
Medical Education-Total	--	--	--	--	--	449
Allopathic	209	35.0	5.3	7.2	148	357
Osteopathic	--	--	--	--	92	92
Dental Education	67	36.0	6.0	20.9	--	67
Veterinary Medicine Education	74	55.4	2.7	8.1	--	74
Pharmacy Education	146	60.3	27.4	6.7	30	176
Public Health	58	70.7	8.6	6.9	16	74
Registered Nursing	2,734	91.1	11.0	5.9	339	3,073
Licensed Practical Nursing	1,543	90.5	25.1	2.9	--	1,543
Nurse Assisting	2,122	92.5	38.0	8.9	--	2,122
Physician Assisting	29	62.1	3.4	3.4	--	29
Physical Therapy	110	77.3	2.7	8.2	38	148
Occupational Therapy	60	90.0	1.7	16.7	--	60
Dental Hygiene	225	100.0	1.8	6.2	--	225
Dental Assisting	120	98.3	12.5	6.7	--	120

Sources: Board of Regents; State Board of Community Colleges; Division of Vocational, Adult, and Community Education; State Board of Independent Colleges and Universities; and independent institution reports; 1990.

Forecasting supply and demand requirements for health professions education policy decision making requires current, high quality data. Supply forecasts for health professionals are more reliable than demand requirements, which are less certain. Although data collection and reporting have improved in recent years, some limitations in the availability, accuracy, and compatibility of pertinent data remain problematic. For example, minority participation rates for education program completions were not easily accessible for all data profiles. Education program participation data are more complete than data pertaining to practicing professionals. Under current data collection and reporting procedures, accurate determination of professional in-migration beyond rough estimates is not feasible. And finally, the tracking of Florida graduates is incomplete.

Despite these limitations in data collecting and reporting and forecasting supply and demand, each health profession data profile contains information and discussion pertaining to enrollments, graduations, minority participation, licensure, in-migration, continuing education, and the labor market. The data in Part Two provide a basis for labor market analysis; however, caution must be taken to allow for changes in health care technology and delivery, disease incidence and patterns, economic forces and the means for reimbursements, and the uneven distribution of health practitioners throughout the population. In addition, there are limitations on the availability and accuracy of data. And finally, political and economic forces outside Florida may greatly influence the in-migration of health professionals from other states.

TABLE 2

LABOR MARKET: SUPPLY AND DEMAND PROJECTIONS FOR SELECTED HEALTH PROFESSIONS

HEALTH PROFESSIONS	TOTAL # ACTIVE LICENSES IN FL 1/1/90[a]	NUMBER PER 100,000 POPULATION IN FL 1988[b]	NUMBER PER 100,000 POPULATION IN U.S. 1988[c]	PROJECTED PERCENTAGE INCREASES, FLORIDA 1987-2000[d]	PROJECTED PERCENTAGE INCREASES, U.S. 1988-2000[e]	AVERAGE ANNUAL OPENINGS, FLORIDA 1987-2000[d]	APPROXIMATE NUMBER OF FLORIDA GRADUATES, 1989-90[f]
Physicians	----	----	----	41.7	28	2,763	449
Allopathic	25,763	229.3	237	----	----	-----	357
Osteopathic	1,638	13.4	----	----	----	-----	92
Chiropathic	2,686	22.9	15.8	----	----	-----	----
Dentists	6,769	56.5	58	36.2	13	626	67
Veterinarians	-----	----	19.2	58.8	20.7	164	74
Pharmacists	9,776	76.0	63.8	45.9	27	1,013	176
Public Health	-----	----	----	----	----	-----	74
Registered Nurses	106,432	881.4	670	67.6	39	7,517	3,073
Licensed Practical Nurses	43,561	352.5	----	78.8	37	4,052	1,543
Nursing Assistants	-----	----	----	83.3	32	5,212	2,122
Physician Assistants	718	6.6	----	58.3	28	169	29
Physical Therapists	4,476	----	----	91.3	57	262	148
Occupational Therapists	1,847	----	----	73.8	49	93	60
Dental Hygienists	4,962	----	----	60.1	18	301	225
Dental Assistants	----	----	----	59.1	19	409	120

Sources: a. HRS Office of Comprehensive Health Planning, 1990.
b. HRS Office of Comprehensive Health Planning, 1989.
c. **Seventh Report of the President and Congress on the Status of Health Personnel in the United States** (1990).
d. Florida Department of Labor and Employment Security, Bureau of Labor Market Information, 1990.
e. U.S. Department of Labor, Bureau of Labor Statistics, 1990.
f. Board of Regents, State Board Community Colleges; Division of Vocational, Adult, and Community Education; State Board of Independent Colleges and Universities; and individual institution reports; 1990.

In addition to presenting data on the individual health professions, each chapter includes a summary of previous Commission studies concerning the health profession discussed in that chapter. The Commission's initial concerns with health professions education are revealed in its 1983 document, **Health Professions Report**. The purpose of that study was to develop a comprehensive health professions education plan for the State. Based on the findings, the Commission recommended an analysis of the types of health education programs needed, geographical locations of these programs, settings in which such education should occur, and funding and tuition policies. In addition, a process to obtain reliable state health labor market information was outlined. In the following years, eight professions were studied individually and reports submitted to the Legislature. These included nursing (1983), public health (1983), dentistry (1984), chiropractic education (1984), medical education (1985), allied health (1986), pharmacy (1987), and veterinary medicine (1987).

Following completion of these studies, the 1987 Legislature charged the Commission to "continue to prepare a review of the status of all health professions education programs included in the Comprehensive Health Professions Education Plan and provide current information on enrollment and graduate levels, a review of market place demand for graduates, and an analysis of new policy issues and the disposition of former recommendations." The subsequent report entitled **Comprehensive Health Professions Plan Review for Florida** (1988) identified five issues relevant to health professions education in Florida, including the labor market, programs, minority participation, geriatrics, and cost containment. The Commission recommended that the State continue to support the Department of Health and Rehabilitative Services' ongoing supply and demand analyses for all major health professions, to monitor program enrollments and degree completions, and to support minority participation initiatives. The Commission further recommended that the Statewide Health Council coordinate a statewide planning group with representation from education, government, and industry to discuss labor market issues and to assist educational sectors in responding to the state's needs for these professions. In addition, the Commission recommended integrating geriatrics and cost containment concepts into the curricula and exploring the feasibility of joint programs as a cost containment strategy.

V. MEDICAL EDUCATION

United States medical schools are highly diverse, each having evolved to meet local, regional, or national goals within its own organizational, financial, and social restraints. This diversity has provided the nation with a wide variety of medical service options that are adapted to local and regional differences. Since the mid-1970s, the role played by medical schools in the national medical care effort has increased. Society has come to expect constant gains in the prevention, diagnosis, and treatment of disease and continual improvement in complex academic medical centers with the primary goal of advancing the health of the nation through education, research, and patient care.

Allopathic medical doctors practice medicine that makes use of all measures proven effective in the treatment of disease. Osteopathic medicine is similar to allopathic medicine except that its practice emphasizes the importance of the musculoskeletal structure and manipulative therapy in the maintenance and restoration of health.

In 1985, the Commission completed **Medical Education in Florida** (1985), a study that examined issues concerning state policy for medical education, including supply of and demand for physicians, student access, public support for independent schools, tuition and financial aid, and minority participation. The report reviewed nationwide trends in medical practice and education and analyzed the state's needs for medical education. The Commission found that Florida had been well served by the existing three medical schools and recommended that, unless the rate of in-migration of physicians dropped markedly, there should be no expansion in the number of medical schools or any increase or decrease in enrollment levels. The geographic distribution of the medical schools provides reasonable access to all regions of the State. The Commission encouraged increased minority participation through efforts to improve performance and preparation of minority students in the earlier stages of education. The report also noted that the state-level graduate financial aid programs for minorities met the needs of minority medical students and suggested a number of strategies to ensure that adequate information on financial aid was shared with prospective minority medical students.

The report recommended that the medical schools provide adequate geriatric clinical experience and include the role of geriatrics in the curriculum and licensing process. The Commission analyzed the role of the independent sector in providing medical education and, while affirming its contribution, found the need for more regular review of the state's policies and the need to tie state support to changing state policy objectives. Recommendations were also made for an increase in tuition to provide for a greater share of the cost of their education to be borne by medical students and establishment of a service-conditional loan forgiveness program for medical students (Section 240.4067, Florida Statutes). The Commission concluded that, over the next two decades, significant changes should be expected in the medical profession, which may impact the supply of and demand for medical doctors and the role of medical schools. Florida will need to continue to assess the medical education needs in the State and evaluate the ability of the present medical education structure to meet the needs.

Education

There are 127 medical schools in the nation; 126 are accredited to award the M.D. degree. Three allopathic medical schools are located in Florida, two of which are public (University of Florida and University of South Florida), and one is private (University of Miami). There are 15 accredited colleges of osteopathic medicine, one of which is located in Florida--Southeastern University of the Health Sciences.

Applicants, Enrollees, and Graduates: United States

Nationally, interest in attending colleges of allopathic medicine has declined in the 1980s as illustrated by numbers of applicants and first-year enrollees. While first-year enrollments for women continue to rise, they have fluctuated for minority groups with only Asian/Pacific Islander students making significant gains in the 1980s. The Association of American Medical Colleges reports that the number of applicants to allopathic medical schools decreased from 36,727 in the peak year of 1981 to 26,915 in 1989. The applicant-to-acceptance ratio reached a high of 2.8 during the mid-1970s but declined to 1.6 in 1988 and 1989, the lowest in the past 30 years. First-year enrollments peaked in 1981 at 17,268, then fluctuated throughout the 1980s, and ended the decade at 16,756 in 1989 (Table 3). First-year enrollments for women continued to rise and accounted for 38.0 percent of the 1989 class. First-year enrollments for black students rose from 1,128 (6.6%) in 1980 to the peak of 1,221 (7.3%) in 1987, declined to slightly 1,210 (7.2%) in 1988, then rose again to 1,221 in 1989 (7.3%). The number of Hispanic students peaked in 1986 at 954 (5.7%), declined in 927 (5.5%) in 1987, and regained part of the loss in 1988 to 949 students (5.6%). Asian/Pacific Islander students have steadily increased in first-year enrollments from 572 (3.3%) in 1980 to 2,100 (12.3%) in 1988.

Total enrollments for U.S. allopathic medical schools increased from 65,189 in 1980 to an all-time high of 67,327 in 1983 and then declined to 65,016 in 1989. Total enrollment for women, however, continued to rise to 23,513, representing 36.1 percent of the class. The number of graduates from medical schools decreased each year since 1985, from the peak of 16,343 in 1985 to 15,630 in 1988. The number of women graduates rose to 5,221 in 1988, representing 33.4 percent of the graduates.

The U.S. Department of Health and Human Services reports that the American Association of Colleges of Osteopathic Medicine processes applications for admission to 13 of the 15 colleges of osteopathic medicine (including Southeastern University of the Health Sciences). The first-year enrollment for the 15 osteopathic colleges reached an all-time high of 1,844 in 1989 (Table 3). Women constituted 33.4 percent (615) of the first-year enrollment, also an all-time high. In 1989, minority students also reached all-time first-year enrollment highs overall but with mixed change for individual minority groups: black enrollments decreased from 83 (4.7%) in 1988, which had been a large increase over previous years, to 68 (3.7%); Hispanics decreased slightly to 79 (4.3%); and Asian/Pacific Islanders increased to 158 (8.6%).

Total enrollments at osteopathic medical colleges increased to 6,640 in 1986, decreased in 1987, and then regained part of the loss in 1988 and 1989 to 6,615. Total enrollments for women have continued to rise to 2,056 in 1989, representing 31.1 percent of enrollments. Of the 6,615 students in 1989, 173 were black (2.6%), 246 Hispanic (3.7%), and 463 Asian (7.0%). The number of graduates peaked in 1989 at 1,609, as did the number of women graduating at 491 (30.1%). Of the 1,609 graduates in 1989, 36 were black (1.9%), 60 Hispanic (3.7%), and 69 Asian (4.3%).

Applicants, Enrollees, and Graduates: Florida

Prior to 1950, Florida had no medical school. During the 1950s, the University of Miami was recognized as the first accredited medical school by the Florida legislature and has been provided with a per capita subsidy annually from the State ever since. For 1990-91, the value of the subsidy per student is $25,290. In 1956, the University of Florida accepted its first class, and the University of South Florida's charter class enrolled in 1971. Florida State University offers the Program in Medical Sciences (PIMS), which serves as an alternative location for students from Florida State University, Florida Agricultural and Mechanical University, and the University of West Florida to attend the first year of medical school for the University of Florida College of Medicine. The state's only osteopathic medical school, Southeastern University of the Health Sciences, an independent institution, opened in 1980.

The applicant-to-acceptance ratio for the public colleges of medicine was 12.8 for the University of Florida and 6.2 for the University of South Florida in 1989, both showing slight increases in recent years and well above the national ratio of 1.6 in 1989. First-year enrollments for the public institutions rose from 208 in Fall 1984 to 216 in 1987, 215 in 1988, and 218 in 1989 (Table 3). The entering class in 1989 at the University of Florida was 40 percent women, and for the University of South Florida 36 percent of the class were women, compared to the national average of 38 percent women in 1989. In 1989, the University of Florida had seven black students (5.9%) enrolled in the entering class; and the University of South Florida had three black students (3%), compared to the national average of 7.3 percent in 1989. In 1988, the national average for first-year Hispanic students was 7.2 percent; while in 1989, the University of Florida enrolled seven Hispanic students (5.9%) and the University of South Florida enrolled 11 Hispanic students (11%) in their entering classes. The Florida institutions enrolled approximately nine percent Asian/Pacific Islander students in the 1989 entering class, compared to the 1988 national average of 12.3 percent.

TABLE 3

FLORIDA AND NATIONAL FIRST-YEAR MEDICAL EDUCATION ENROLLMENTS: TOTAL NUMBERS AND PERCENTAGE BREAKDOWN FOR WOMEN, BLACKS, AND HISPANICS FALL 1987 TO FALL 1989

FIRST-YEAR ENROLLMENTS	FALL 1987	FALL 1988	FALL 1989
University of Florida*			
Total Number	117	117	115
Percentage Women	35.9	40.2	48.7
Percentage Black	5.1	6.0	8.7
Percentage Hispanic	7.7	6.0	6.1
University of South Florida			
Total Number	99	98	100
Percentage Women	28.3	32.7	36.0
Percentage Black	2.0	3.1	3.0
Percentage Hispanic	11.1	9.2	11.0
University of Miami			
Total Number	145	140	136
Percentage Women	35.9	34.3	30.0
Percentage Black	7.6	10.7	7.4
Percentage Hispanic	13.1	12.9	19.1
Southeastern University			
Total Number	103	108	117
Percentage Women	22.3	28.7	26.5
Percentage Black	1.9	4.6	6.0
Percentage Hispanic	7.8	8.3	14.5
National-Allopathic			
Total Number	16,713	16,868	16,756
Percentage Women	36.5	37.1	38.0
Percentage Black	7.3	7.2	7.3
Percentage Hispanic	5.5	5.6	4.3
National-Osteopathic			
Total Number	1,692	1,772	1,844
Percentage Women	29.0	32.2	33.4
Percentage Black	2.2	4.7	3.7
Percentage Hispanic	3.5	4.6	4.3

*includes PIMS at FSU (See Table 5)

Sources: Board of Regents, Office of Health Affairs; Southeastern University of the Health Sciences; Association of American Medical Colleges; and American Association of Colleges of Osteopathic Medicine; 1990.

Total enrollments for Florida public colleges of allopathic medicine declined from 837 in 1987, to 835 in 1988, to 833 in 1989 (Table 4). During the two-year period of Fall 1987 to Fall 1989, the enrollment decline reflected slight declines in the programs at the University of South Florida and at Florida State University (PIMS), while the University of Florida experienced slight increases in enrollment. The percentage of women enrolled in the public colleges of medicine continued to rise to 310 (37.2%) in 1989, compared to 36.2 percent nationally in 1989. While black student enrollment continued to rise to 40 students (4.8 percent, compared to 6.4 percent nationally) and Asian/Pacific Islander enrollments to 62 (7.7%) in 1989, Hispanic enrollment declined to 61 students (7.7%). Of the 40 black students enrolled in 1989, five attended PIMS, 27 attended the University of Florida, and eight attended the University of South Florida. Of the 61 Hispanic students in 1989, 36, or 59.0 percent, attended the University of South Florida (Tables 4 and 5).

TABLE 4

STATE UNIVERSITY SYSTEM COLLEGES OF MEDICINE TOTAL PREDOCTORAL ENROLLMENTS BY GENDER AND RACE/ETHNICITY FALL 1987 TO FALL 1989

FALL ENROLLMENTS	1987		1988		1989	
	NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT
Total	837	100	835	100	833	100
Male	563	69.8	549	65.7	523	62.8
Female	274	30.2	286	34.3	310	37.2
Black	30	3.7	39	4.7	40	4.8
Hispanic	78	9.3	66	7.9	61	7.3
Asian and Pacific Islander	50	6.2	58	7.2	62	7.7

Source: Board of Regents, Count of Student Records Including Fee Waiver; and Florida State University, Program in Medical Sciences, 1990.

TABLE 5

FLORIDA STATE UNIVERSITY PROGRAM IN MEDICAL SCIENCES FIRST-YEAR ENROLLMENTS BY GENDER AND RACE/ETHNICITY FALL 1987 TO FALL 1989

FALL ENROLLMENTS	1987 NUMBER	 PERCENT	1988 NUMBER	 PERCENT	1989 NUMBER	 PERCENT
Total	30	100	28	100	28	100
Male	21	70	17	60.7	13	46.4
Female	9	30	11	39.3	15	53.6
Black	--	--	1	3.6	5	17.9
Hispanic	2	6.7	2	7.1	1	3.6

Source: Florida State University Program in Medical Sciences, 1990.

During 1987-88 and 1988-89, the number of graduates from Florida public allopathic medical schools remained stable at 198 per year; approximately 30 percent were women (compared to 33.4 percent women nationally) (Table 6). In 1989-90, the number of graduates increased to 209, with women accounting for approximately 35 percent of this number. The numbers and percentage of Asian/Pacific Islander graduates increased since 1987-88 to 16 graduates (7.7%) in 1989-90. The proportion of black graduates remained stable at 4.5 percent for 1987-88 and 1988-89 (compared to 5.3 percent nationally) and then increased to 5.3 percent in 1989-90. The proportion of graduates who were Hispanic reached a high of 9.6 percent in 1988-89 and then decreased to 7.2 percent in 1989-90.

TABLE 6

STATE UNIVERSITY SYSTEM COLLEGES OF MEDICINE DEGREES GRANTED BY GENDER AND RACE/ETHNICITY 1987-88 TO 1989-90

DEGREES GRANTED	1987-88 NUMBER	 PERCENT	1988-89 NUMBER	 PERCENT	1989-90 NUMBER	 PERCENT
Total	198	100	198	100	209	100
Male	137	69.2	136	68.7	135	64.6
Female	61	30.8	62	31.3	74	35.4
Black	9	4.5	9	4.5	11	5.3
Hispanic	15	7.6	19	9.6	15	7.2
Asian and Pacific Islander	7	3.5	11	5.6	16	7.7

Source: Board of Regents, Postsecondary Completions HEGIS/IPEDS, 1990.

The state's independent school of allopathic medicine at the University of Miami decreased its first-year class size from 145 in 1987, to 140 in 1988, and to 136 in 1989. The school's total enrollment experienced similar decreases from 631 in 1987, to 578 in 1988, and 565 in 1989. The number of graduates with M.D. degrees decreased from 147 in 1987-88 (181 graduates including 34 Ph.D. degrees), to 144 in 1988-89, and then increased to 148 graduates in 1989-90. Adding the number of graduates from the University of Miami to the public allopathic institutions' numbers, the total number of M.D. graduates in the State was 345 in 1987-88, 342 in 1988-89, and 357 in 1989-90.

Southeastern University of the Health Sciences, the only college of osteopathy in the State, opened with 40 students in 1981 and increased its first-year class size to 103 in 1987, 99 in 1988, and 117 in 1989. The applicant-to-acceptance ratios for these years were 6.3 in 1987, 5.2 in 1988, and 4.4 in 1989. Among the 117 first-year students in 1989, seven (6.0%) were black and 17 (14.5%) were Hispanic. The number of degrees granted during the past three years was 97 in 1987-88, 99 in 1988-89, and 92 in 1989-90. Among the 92 graduates in 1989, one graduate was black (1.1%) and 9 were Hispanic (9.8%), compared to 1989 national percentages of 1.9 and 3.7, respectively. Adding the graduation numbers for D.O. degrees to M.D. degrees, 442 physicians graduated from Florida institutions in 1987-88, 441 in 1988-89, and 449 in 1989-90.

Licensure and Continuing Education

To be a practicing physician in Florida, licensure is required by the Department of Professional Regulation Board of Medicine for medical doctors (M.D.) under Chapter 458, Florida Statutes, and the Board of Osteopathic Medicine for osteopathic physicians (D.O.) under Chapter 459, Florida Statutes. Chapter 458, Florida Statutes, provides for the requirements and fees for licensure of medical doctors by examination or endorsement and for the biennial renewal of licenses. The Board of Medicine requires 40 hours of continuing education, five of which are required in risk management, for the biennial renewal of licensure.

Any person desiring to be licensed to practice osteopathic medicine in Florida is required to be a graduate of a college recognized and approved by the American Osteopathic Association, have obtained a passing score on all parts of the examination conducted by the National Board of Examiners for Osteopathic Physicians and Surgeons, and have successfully completed an approved resident internship of not less than 12 months. Section 459.007, F.S., provides for licensure by endorsement of persons licensed elsewhere in the United States as osteopathic physicians. The Board of Osteopathic Medical Examiners requires 40 hours of continuing education for the biennial renewal of licensure (30 hours required in osteopathic and five hours in risk management).

Labor Market: Supply and Demand

The Florida Department of Professional Regulation reports that the supply of medical doctors in Florida, as measured by the total number of allopathic medical doctors licensed to practice, has increased from 14,382 in 1971 to 48,024 in 1989. As of January 1990, there were 25,763 allopathic medical doctors with active licenses resident in the State. The **1990 Florida Health Care Atlas** reports that Florida's three allopathic medical colleges graduate approximately one-fourth (nearly 360) of the new practitioners licensed each year, compared to three-fourths resulting from in-migration. The number of medical doctors per 100,000 population in Florida was 229.3 in 1988, compared to 237 nationally in

1988 (U.S. Congress, Office of Technology Assessment, 1990). The supply of medical doctors, however, is not distributed evenly throughout the State; by county, the ratio of medical doctors per 100,000 ranged from 20.5 to 741.1.

The number of osteopathic physicians has also been increasing in Florida. Total licensed osteopathic physicians increased from 2,006 in 1971 to 4,695 in 1989. The number of active osteopathic physicians resident in the State in January 1990 was 1,638. Florida's only college of osteopathy graduates approximately 100 students per year, while part of the annual increase in osteopathic physicians is attributed to in-migration. The **1989 Florida Health Care Atlas** reports that in 1988 there were 13.4 osteopathic physicians to 100,000 population in Florida, ranging from no osteopathic physicians in 17 counties to a county ratio of 38.7 per 100,000 population (Lafayette County with 50 osteopathic physicians).

The Florida Department of Labor and Employment Security, Bureau of Labor Market Information projects that between 1987 and 2000, the number of physicians in Florida will increase by 10,934 physicians (from 26,250 in 1987 to 37,184 in 2000). This represents an increase of 41.7 percent between 1987 and 2000, as compared to national projections for a 28 percent increase between 1988 and 2000. The Bureau of Labor Market Information projects a total of 2,763 average annual openings for employment in Florida between 1987-2000, based on the projection for expansion of 1,922 positions and 2,763 vacancies due to retirement, death, or other separation from the work force.

Medical education institutions in the State of Florida graduate approximately 450 allopathic and osteopathic physicians per year, which constitutes approximately 16 percent of projected annual demand. Since demand for physicians in Florida is projected to be greater than national demand for the rest of the century, employment opportunities within the State should continue to encourage in-migration. As illustrated by the physician-to-100,000 population ratios, however, the true labor market challenge will continue to be attraction of physicians to low-economic areas of the State.

VI. CHIROPRACTIC EDUCATION

The U.S. Department of Health and Human Services describes chiropractic as a system of mechanical therapeutics consisting primarily of the adjustment or manipulation of the spinal column. Chiropractic science concerns itself with the relationship between structure, primarily the spine, and function, primarily coordinated by the nervous system, of the human body as that relationship may affect the restoration and preservation of health. In both training and practice there are two distinct approaches to patient care. The first and most conservative approach, commonly known as "straight" chiropractic, involves care that is confined almost exclusively to adjustments of spinal vertebrae. Chiropractors who are a wider variety of treatments may prescribe an additional form of treatment, such as ultrasonics, diathermy, ultra violet (heat and light), and acupuncture, for a large number of functional disorders related to all musculo-skeletal problems. Since chiropractic is defined by a state's licensure laws and regulations, the U.S. Department of Health and Human Services cautions that with such variation in the practice of chiropractic, discussions of chiropractic characteristics, requirements, and services cannot be precise, and, in addition data about chiropractic are limited.

As part of the comprehensive health professions education plan, the Commission was directed by the Legislature to include consideration of chiropractic education. The supply of and demand for chiropractors in Florida were analyzed to determine policy implications for postsecondary education in Florida. The Commission's 1984 study, **The Need for Chiropractic Education in Florida**, found the supply of chiropractors in Florida sufficient to meet existing demand. At the time of the study, no Florida educational institution provided chiropractic education; however, Florida residents attended chiropractic colleges in other states. In light of the absence of unmet need for chiropractic services in the State, the Commission recommended that no recurring or substantial investment of state funds should be initiated for chiropractic education in Florida.

Education

Of the 17 schools of chiropractic in the United States, three held accreditation from the Straight Chiropractic Academic Standards Association (SCASA), and 14 were accredited by the Council on Chiropractic Education (CCE). The purpose of chiropractic education is to prepare the doctor of chiropractic as a primary health care provider. Candidates for admission to chiropractic programs are required to have completed a minimum of 60 semester hours, or equivalent, of college credit leading toward a baccalaureate degree at an institution or institutions accredited at the college level by an agency that has been recognized by the Secretary of Education.

The 1990 annual report of the Council on Chiropractic Education indicated that for the 14 chiropractic institutions that hold accreditation status with the CCE, there were 5,320 freshmen applications, 2,786 freshmen matriculations, and 9,881 total fall enrollments in 1987-88. The applicant-to-matriculated freshmen ratio was 1.9 to one. The U.S. Department of Health and Human Services reports that in 1988 there were approximately 10,000 students enrolled in chiropractic education, including 2,500 women. Approximately 2,500 students graduated from schools of chiropractic in 1988-89. The Palmer College of Chiropractic (Iowa) graduated the largest number of students (532) in 1988.

There is no school of chiropractic in Florida, nor are there any academic contracts through the Southern Regional Education Board for chiropractic. Florida residents, however, do attend schools of chiropractic in other states. Four schools of chiropractic are located in member states of the Southern Regional Education Board including Life Chiropractic College (Georgia), Sherman College of Straight Chiropractic (South Carolina), Parker College of Chiropractic (Texas), and Texas Chiropractic College (Texas). In Fall 1990, there were 214 Florida residents enrolled in these four schools of chiropractic, including 165 Floridians enrolled in Life Chiropractic College in Georgia.

Licensure and Continuing Education

Chiropractic physicians are regulated through the Board of Chiropractic, Department of Professional Regulation. Chiropractic physicians are licensed under Chapter 460, Florida Statutes. Any chiropractic physician who has complied with the provisions of Chapter 460, F.S., may examine, analyze, and diagnose the human living body and its diseases by the use of any physical, chemical, electrical, or thermal method; use the x-ray for diagnosing; and may elect to be certified to phlebotomize, use physiotherapy or acupuncture, or administer proprietary drugs.

To be eligible for license examination, candidates must have a bachelor's degree and have earned a doctorate in chiropractic medicine from an accredited college; completed a three-month training program in Florida of at least 300 hours with a Florida-licensed chiropractic physician; and successfully completed the National Board of Chiropractic Examiners certification examination within 10 years immediately preceding application for licensure. License renewal is required biennially through the Florida Board of Chiropractic and is conditional upon the completion of 40 hours of continuing education, five hours of which must be in risk management.

Labor Market: Supply and Demand

The U.S. Department of Health and Human Services reports that in 1988 there were an estimated 39,000 chiropractors in active practice. This estimate provides a ratio of 15.8 active chiropractors per 100,000 population in 1988, compared with a ratio of 12.7 in 1985 and 9.6 in 1978.

The **1990 Florida Health Care Atlas** reports that the number of Florida resident chiropractic physicians with active licenses increased from 724 in 1971 to 2,686 in 1990. In 1989-90, 196 chiropractic physicians passed the Florida Board examination to attain licensure, an increase from 187 in 1988-89. The ratio of chiropractic physicians-to-Florida population in 1988 was 22.9 to 100,000. There were seven counties, however, without any chiropractors in 1988; the counties with low representation were rural. Most counties with high ratios are along the coast in central and southern Florida. Other than the counties without any chiropractic physicians, the range between low and high ratio counties was from 2.1 to 48.2 chiropractors to 100,000 population. The trend toward urban practice is also evident nationally.

The U.S. Department of Health and Human Services reports that in 1988 ten percent of active chiropractors in the United States were female, an increase from five percent in 1978. It was estimated that in 1988 there were no more than 500 black chiropractors in active practice, not more than 50 of whom were women. These estimates indicate that blacks, and especially black women, are very underrepresented among chiropractors in active practice.

The U.S. Department of Health and Human Services projects that the number of chiropractors will increase substantially in coming years. The increase may be attributed in part to a low net annual separation rate of three percent from the active pool as a result of retirements, deaths, and other causes. The Department reported that the number of schools of chiropractic is expected to be stable over the next five years, as will be the number of students enrolled and the number of graduates.

In 1990, the U.S. Department of Labor, Bureau of Labor Statistics reported that the demand for chiropractic is related to the ability of patients to pay, either directly or through health insurance, and to public acceptance of the profession, which appears to be growing. Although newly graduated chiropractic physicians have entered practice with little difficulty, the number of graduates from chiropractic colleges has increased fourfold since the early 1970s. As more students graduate, new chiropractic physicians may encounter increasing competition.

Although the State of Florida has no school of chiropractic nor academic contracts with the Southern Regional Education Board, the supply of chiropractic physicians has grown through Florida residents receiving their education in other states and through in-migration. Despite the reliance upon these means of supply, the State reported 22.9 active chiropractors per 100,000 population in 1988, compared to 15.8 nationally. There is no evidence to suggest there is unmet demand for chiropractors or the need to fund chiropractic education in the State.

VII. DENTAL EDUCATION

The U.S. Department of Health and Human Services reports that changes occurring in dentistry today have important implications for the future of dental education and the labor market. Dental disease patterns are changing: dental decay in children has dropped; the human immunodeficiency virus (HIV) and the later stages of the disease, acquired immunodeficiency syndrome (AIDS), are changing the standard of care for infection control; advances in dental technology and in new restorative materials are allowing dentists to be more productive; and the nation's aging population requires different types of dental services than are provided for children and younger adults.

In **Dental Education in Florida** (1984), the Commission reviewed nationwide trends in dental practice and dental education and analyzed the supply of and demand for dental care in Florida. The array of educational programs for dentists, dental hygienists, dental assistants, and laboratory technicians was analyzed and recommendations were offered to improve the quality and accessibility of dental care in Florida and to promote cost-effectiveness in dental education offerings. The study found that the State was well-served by having one dental school of high quality (College of Dentistry at the University of Florida). The Commission stated that the supply of dentists in Florida was adequate to meet the demands of the population yet cautioned that the maldistribution of dental practitioners could not be addressed through the educational system. The Commission recommended that the University of Florida reassess the mission of the College of Dentistry and consider giving greater emphasis to establishing a stronger research component, particularly in the areas of geriatrics and gerontology. Another recommendation suggested that the University of Florida consider designating geriatric dentistry as a top priority for research and instruction.

The report reviewed education and projected employment needs for dental hygienists, assistants, and laboratory technologists and found that projected employment demand for the State would be met at present enrollment and completion rates and by in-migration of trained professionals from other states. Therefore, the Commission recommended against expanding the number of dental hygiene, assisting, or laboratory technology programs. Any future enrollment adjustments should be reviewed at the regional level. The Commission expressed concern for the need to differentiate more finely between associate of science programs and certificate programs to discourage inflation in the degree required for job-entry. Finally, the report recommended increasing minority enrollment in dental hygiene, assisting, and technology programs.

The second study of **Dental Education in Florida** (1989) encompassed dental, dental hygiene, and dental assisting education with information provided on professional and educational aspects of dentists and dental auxiliaries both statewide and nationally. While particular attention was given to the supply of and demand for dentists, hygienists, and assistants, other issues were identified concerning licensure, employment sites, and education. Although the College of Dentistry at the University of Florida offered the only dental program in the State, the study concluded that no enrollment expansion was warranted in the University of Florida program. The Commission recommended additional promotion of careers in dentistry and supported the collection of data for supply and demand projections.

In relation to dental hygiene education, the Commission recommended more flexible programming and consideration of alternative education approaches such as expanded scheduling, off-campus programs, and cooperative programs among community colleges. It was also recommended that the State Board of Community Colleges address curricular length and that the associate of science degree award for dental hygiene continue to meet general education requirements for an associate degree.

The number of formal, one-year dental assisting programs appeared to be sufficient to meet the needs of the State. The Commission recommended that the Board of Dentistry develop criteria to approve both on-the-job training and formal dental assisting programs. Furthermore, it recommended maintaining the offering of the dental assisting program at the postsecondary vocational education level with a certificate award. Also recommended was the development of guidelines for articulation between dental assisting programs and associate degree dental hygiene programs and increased representation of black students in the entering classes in the College of Dentistry and in dental hygiene programs.

Education

Dental education encompasses a four-year professional program culminating in a doctoral degree in dental surgery (D.D.S.) or in dental medicine (D.M.D.), following completion of a required preprofessional college curriculum. The degrees are equivalent and awarded upon completion of the same types of programs. Applicants to dental schools must have a background in the sciences as well as in general education. The academic curriculum in dental schools focuses on preparing the practitioner to meet the challenges of the 1990s as dental disease patterns change and the population ages. The U.S. Department of Health and Human Services reports that all dental schools have geriatric curriculum components to better train dental students in geriatric dentistry. The dental curriculum also has concentrated on the area of infection control, especially in regard to Hepatitis B and HIV/AIDS.

Specialty training programs require two to three years of postdoctoral study in one of eight specialties recognized by the American Dental Association (ADA) including dental public health, endodontics, oral pathology, oral surgery, orthodontics, pediatric dentistry, periodontics, and prosthodontics. The U.S. Department of Health and Human Services reports that at present specialists account for approximately 16 percent of all active dentists. A 1987 American Association of Dental Schools (AADS) survey of dental school seniors disclosed that one of three seniors plan to pursue postgraduate training immediately upon graduation, which reflects a continuing upward trend in the number of dentists expressing interest in specialization.

In its 1989-90 Annual Report, the American Dental Association listed 58 accredited dental schools in the United States, and among these, three are reported as discontinuing their predoctoral dental programs and are no longer accepting entering classes. One accredited dental school is located in Florida at the University of Florida and offers the doctoral in dental medicine (D.M.D.). There are 18 schools of dentistry in member states of the Southern Regional Education Board.

Applicants, Enrollees, and Graduates: United States

Nationally, interest in attending schools of dentistry has declined since the mid-1970s as evidenced by fewer applicants, lower enrollments, and fewer degrees granted. The U.S. Department of Health and Human Services reports that the number of applicants to, and the number of first-year enrollees in, dental schools have declined from the peak years of 1975 (15,734 applicants) and 1978 (6,301 first-year enrollees). American Dental Association data reveal that during the past five years the number of applicants fell from 6,216 in 1985 to 4,964 in 1989. The number of first-year enrollees fell from 4,843 in 1985 to 3,979 in 1989 (Table 7). These numbers represent a ratio of applicants to first-year enrollees of 1.28 in 1985 and 1.25 in 1989. This ratio, which serves as a measure of academic selectivity, declined consistently from the mid-1970s to 1988's low of 1.20. The slight upturn in the ratio of applicants to first-year enrollees in 1989 suggests a possible leveling off of the decrease. Similar declines have also been reported by the American Dental Association for total predoctoral enrollments and graduations nationwide. The number of total enrollees declined from 19,563 in 1985 to 16,412 in 1989. During the same time period, the number of graduates declined from 5,353 in 1985 to 4,312 in 1989.

While total enrollments declined, women constituted an increasing proportion of first-year enrollees (Table 7). The U.S. Department of Health and Human Services reports that the percentage of female applicants and enrollees increased steadily since 1969 when only 1.6 percent of first-year students were female. In 1989, the percentage of female first-year enrollees was 34.4 (1,367 of 3,979). Although the percentage of female first-year enrollees continued to rise, the absolute number decreased from a peak of 1,410 in 1987 to 1,367 in 1989. Data from the American Dental Association show similar figures for female graduates during the past five years. The percentage of female to total graduates rose from 21.3 in 1985 to 27.6 in 1989; however, the absolute number of female graduates declined from a peak of 1,263 in 1988 to 1,188 in 1989.

Racial/ethnic minority groups have also increased their proportional representation in dental education despite declines in absolute numbers. The U.S. Department of Health and Human Services reports that the number of black applicants declined slightly since the early 1970s, whereas the number of Hispanic applicants increased. American Dental Association data reveal that the number of black first-year enrollees decreased from 281 in 1985 to 263 in 1989; however, these numbers represent an increase in the percentage of black students from 5.8 in 1985 to 6.6 in 1989 (Table 7). Similarly, the number of black graduates declined from 223 in 1985 to 193 in 1989, representing an increase in percentages from 4.2 and 4.5 respectively. The number of Hispanic first-year enrollees decreased from 312 in 1985 to 284 in 1989; however, these numbers also represent an increase in the percent of Hispanic students from 6.4 in 1985 to 7.1 in 1989. In contrast, the number of Hispanic graduates increased from 213 in 1985 to 296 in 1989, representing an increase in the percentages from 4.0 in 1985 to 6.9 in 1989.

TABLE 7

NATIONAL FIRST-YEAR ENROLLMENTS AND GRADUATES FOR SCHOOLS OF DENTISTRY: TOTAL NUMBERS AND PERCENTAGE BREAKDOWN FOR WOMEN, BLACKS, AND HISPANICS 1985 AND 1989

	1985	1989
First-Year Enrollments		
Total Number	4,843	3,979
Percentage Women	28.6	34.4
Percentage Black	5.8	6.6
Percentage Hispanic	6.4	7.1
Graduates		
Total Number	5,353	4,312
Percentage Women	21.3	27.6
Percentage Black	4.2	4.5
Percentage Hispanic	4.0	6.9

Source: American Dental Association, 1990.

Applicants, Enrollees, and Graduates: Florida

The College of Dentistry at the University of Florida is the only dental school in the State. Although the legislature designated the University of Florida as the site of a proposed college of dentistry in 1957, its charter class was not enrolled until Fall 1972. Dental education at the University of Florida is a four-year program to prepare students for general practice. Advanced education programs are available in oral and maxillofacial surgery, orthodontics, pediatric dentistry, periodontics, dental public health, general practice residency, and general dentistry. The College of Dentistry is fully accredited by the Commission on Dental Accreditation of the American Dental Association.

Reports from the Board of Regents and the University of Florida College of Dentistry indicate that the college has experienced greater stability in the number of applicants, first-year enrollees, and graduates than most other dental schools as illustrated in the national trends. For the class that matriculated in August 1990, the ratio of applicants to first-year enrollees was 3.55 to one. The number of first-year enrollees has remained relatively stable at approximately 76 students between 1985 and 1990.

Total predoctoral enrollment for the College of Dentistry decreased from 301 in 1985 to 293 in 1989 (Table 8). This decline represents a three percent decrease in enrollment compared to the 16 percent decrease nationally. The College of Dentistry reports total predoctoral enrollment for Fall 1990 to be 284. Greater fluctuation has been occurring in the number of annual graduates from the College of Dentistry (Table 9). The number of graduates dropped from 69 in 1984-85 to 59 in 1988-89; however, 78 students graduated in 1985-86, 69 in 1986-87, and 70 in 1987-88 for a five-year average of 69 graduates. The decline between 1985 and 1989 represents a 14.5 percent decrease compared to the 19 percent decrease nationally. Yet the five-year average for the College demonstrates a general level of stability in the graduation rate. The College of Dentistry reports 67 graduates for 1990.

TABLE 8

UNIVERSITY OF FLORIDA COLLEGE OF DENTISTRY TOTAL PREDOCTORAL ENROLLMENTS BY GENDER AND RACE/ETHNICITY FALL 1987 TO FALL 1989

FALL ENROLLMENTS	1987		1988		1989	
	NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT
Total	290	100	286	100	293	100
Male	195	67.2	188	65.7	183	62.5
Female	95	32.8	98	34.3	110	37.5
Black	15	5.2	14	4.9	16	5.5
Hispanic	56	19.3	55	19.2	51	17.4
Asian and Pacific Islander	14	4.8	15	5.2	21	7.2

Source: Board of Regents, Postsecondary Completions HEGIS/IPEDS, 1990.

The percentage of female students enrolled in and graduating from the College of Dentistry steadily increased throughout the 1980s (Tables 8 and 9). Female students constituted 38 percent of the total enrollment in Fall 1990, compared to 20 percent in 1985. In contrast to steady increases in enrollments, greater variation in the percentage of female graduates to the total graduates has been present with approximately 27 percent female in 1988-89 and 36 percent in 1989-90.

TABLE 9

UNIVERSITY OF FLORIDA COLLEGE OF DENTISTRY
DEGREES GRANTED BY GENDER AND RACE/ETHNICITY
1987-88 TO 1989-90

	1987-88		1988-89		1989-90	
DEGREES GRANTED	NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT
Total	71	100	59	100	67	100
Male	47	66.2	43	72.9	43	64.2
Female	24	33.8	16	27.1	24	35.8
Black	5	7.0	1	1.7	4	6.0
Hispanic	10	14.1	13	22.0	14	20.9
Asian and Pacific Islander	3	4.2	2	3.4	3	4.5

Sources: Board of Regents, Count of Student Records Including Fee Waiver, 1990.

Enrollments and graduates for racial/ethnic groups have fluctuated at the College of Dentistry during the late 1980s with the exception of Asian/Pacific Islander students who have shown steady increases (Tables 8 and 9). The percentage of black students of the total enrollment at the College of Dentistry, after peaking in Fall 1986 at six percent, fluctuated and registered at 5.6 percent in Fall 1990. The percentage of black graduates rose to seven percent in 1987-88, dropped to 1.7 percent in 1988-89, and rose to six percent in 1989-90. The percentage of Hispanic students of the total enrollment at the College of Dentistry peaked in Fall 1988 at 19.2 percent and then declined to 16.2 percent in Fall 1990. The percentage of Hispanic graduates rose from 14.1 percent in 1987-88, to 22 percent in 1988-89, and decreased to 20.9 percent in 1989-90.

Licensure and Continuing Education

To practice dentistry in Florida, licensure is required by the Department of Professional Regulation (DPR) Board of Dentistry under Sections 466.006, 466.009, and 466.11, Florida Statutes. Individuals seeking licensure must apply to the Department of Professional Regulation and may take the required examinations if they have graduated from a dental school accredited by the Commission on Accreditation of the American Dental Association (ADA), or any other nationally recognized accrediting agency, and have successfully completed the National Board of Dental Examiners' dental examination within 10 years of the date of application (Section 466.006(2), Florida Statutes). Graduates of dental programs not accredited by the ADA, as well as graduates of the University of Havana before 1962, have separate requirements. In addition to licensure requirements, Florida law also mandates a minimum of 30 hours of continuing professional education in dental subjects as a requirement for biennial licensure renewal.

Labor Market: Supply and Demand

The Florida Department of Professional Regulation reports that the supply of dentists in Florida, as measured by the total number of dentists licensed to practice, has increased from 4,200 in 1971 to 10,089 in 1989. The **1990 Florida Health Care Atlas** reports that the total number of resident dentists with active licenses has increased from 2,983 in 1971 to 6,769 in 1990. The Department of Professional Regulation reports that in 1989-90, 338 new licenses were issued following passage of the dental examination. Since the state's only college of dentistry graduates approximately 70 students per year, much of the increase in new licenses is attributed to in-migration. The number of dentists per 100,000 population in Florida was 56.5 in 1988, compared to 58 nationally in 1988 (U.S. Department of Health and Human Resources, 1990). Yet, the supply of dentists is not distributed evenly throughout the State. In 1988, two counties were without any dentist, five counties had fewer that 15 dentists per 100,000 population, and the county having the greatest dentist-to-population ratio had 113 dentists per 100,000 population--twice the national average. The State Dental Resource Consortium at the University of Florida College of Dentistry has initiated a study to identify dental labor market needs and dental practice characteristics in the State. The findings of this study will provide pertinent information concerning the field of dentistry in Florida, and it is anticipated that the findings will be available within the next year.

The Florida Department of Labor and Employment Security, Bureau of Labor Market Information, projects that between 1987 and 2000 the number of dentists in Florida will increase by 2,895 (from 7,999 in 1987 to 10,894 in 2000). This represents an increase of 36.2 percent between 1987 and 2000, as compared to national projections for a 13 percent increase between 1988 and 2000. The Bureau of Labor Market Information projects a total of 626 average annual openings for employment in Florida between 1987 and 2000, based on the projection for the expansion of 223 positions and 403 vacancies due to retirement, death, or other separation from the work force.

The projected demand for dentists of 626 average annual openings in Florida far exceeds the 70 graduates supplied through the College of Dentistry annually. Dependence on the in-migration of dentists trained in other states will continue. Since projected demand for dentists in the nation is only slightly more than one-third of projected demand in Florida, employment opportunities within the State should continue to encourage in-migration of dentists.

VIII. VETERINARY MEDICINE

Veterinarians are primarily responsible for the health of farm livestock, poultry, and companion or pet animals. These animals are the major concern for most veterinarians in private practice as well as in governmental service. The U.S. Department of Health and Human Services states that veterinary medicine contributes to human health and quality of life through the care of animals. It protects people from health risks related to animals and animal products and plays an important role in medical and biological research.

In reviewing veterinary medicine, the Commission examined national, regional, and state labor market reports and found a projected surplus of private veterinary practitioners both nationally and in Florida. The veterinary labor market in Florida, however, is affected by the large in-migration of veterinarians and by the high demand for veterinary education by Florida residents. The Commission's 1987 study, **Veterinary Medical Education in Florida**, concluded that the current enrollment levels should be maintained to ensure the needed supply of veterinarians and to provide access to the veterinary profession for Florida citizens. The report also found that while the state's program at the University of Florida had the second largest black student enrollment of colleges in the United States, black student enrollment was low. The study supported the continued development by the college of initiatives designed to increase the number of black faculty members and improve the recruitment and retention of black students. The study further recommended that to better assess admission policies, curriculum, and program effectiveness, the University of Florida College of Veterinary Medicine should strengthen its efforts to track its graduates. Lastly, the efforts of the Department of Professional Regulation to modify the Florida licensure process so that all foreign veterinary school graduates are required to obtain the Education Commission for Foreign Veterinary Graduates Certificate to be eligible to sit for the licensure examination in Florida were supported.

Education

There are 27 schools of veterinary medicine in the United States; all are accredited by the Council of Education of the American Veterinary Medical Association. Through this association, professional standards of admission, curriculum, teaching methods, research facilities, and libraries are maintained. One accredited school of veterinary medicine is located in Florida at the University of Florida and offers the professional degree in veterinary medicine (D.V.M.).

The U.S. Department of Health and Human Services reported that the veterinary profession commissioned a study on the future directions for veterinary medicine carried out by the Pew National Veterinary Education Program at Duke University. Major conclusions of the study included the recognition that veterinarians will limit their professional activities to a class of animals or species and a larger number will provide increasingly discipline-oriented specialized services. Also concluded was a need to increase the diversity of students admitted to veterinary colleges.

Applicants, Enrollees, and Graduates: United States

Interest in attending schools of veterinary medicine, as demonstrated through numbers of applications and students enrolled, has decreased in recent years.

While women constitute the majority of enrollees and graduates, minority representation remains low. The number of applicants to schools of veterinary medicine has decreased steadily since the early 1980s, from 7,286 in academic year 1980-81 to 3,922 in 1989-90, a 46 percent decrease. Since the number of first-year positions in the schools has changed little during the same time period, the proportion of applicants admitted has increased from 3.3 applicants per first-year position with only 30 percent of the applicants enrolled in 1980-81, to 1.8 applicants per first-year position with 56 percent of the applicants enrolled in 1989-90. The Association of American Veterinary Medical Colleges reports that first-year enrollment peaked in Fall 1984 at 2,327 students and in Fall 1989 for women students at 1,373. First-year enrollment for Fall 1989 was 2,194, with women representing 62.6 percent (Table 10).

TABLE 10

NATIONAL ENROLLMENTS AND DEGREES GRANTED IN VETERINARY MEDICINE: NUMBERS AND PERCENTAGE BREAKDOWN FOR WOMEN, BLACKS, AND HISPANICS
1989

	1989	
	NUMBER	PERCENT
First-Year Enrollments (Fall 1989)	2,194	100
Women	1,394	62.6
Black	62	2.8
Hispanic	65	3.0
Total Enrollments (Fall 1989)	8,456	100
Women	4,995	59.0
Black	219	2.6
Hispanic	220	2.6
Degrees Granted (1988-89)	2,142	100
Women	1,180	55.1
Black	34	1.6
Hispanic	48	2.2

Source: Association of American Veterinary Medical Colleges, 1990.

The Association of American Veterinary Medical Colleges reports that overall, total enrollments in schools of veterinary medicine increased from 8,154 in Fall 1980 to 8,456 in Fall 1989; however, since reaching the peak of 8,938 in Fall 1985, total enrollments have been declining (Table 10). Total enrollments declined approximately 1.2 percent between Fall 1988 and Fall 1989. Total enrollment for women increased from 8,154 in Fall 1980 to the peak of 8,938 in Fall 1985; however the proportion of women has continued to increase to 59 percent in Fall 1989, representing 8,456 women. Nationally, the numbers and percentages of black and Hispanic students increased in Fall 1989 to 219 black students (2.6%) and 220 Hispanic students (2.6%). The U.S. Department of Health and Human Services reports that minority students' proportion of total enrollments has remained nearly constant in recent years and that in 1988-89, about 30 percent of minority students were enrolled in one school, Tuskegee Institute, a historically-black institution.

The number of graduates from schools of veterinary medicine peaked in 1986-87 at 2,219; however, the number of women graduates has continued to increase to 1,180 in 1988-89, representing 55 percent of graduates (Table 10). Between 1986-87 and 1988-89, the number of graduates has declined to 2,142, a 3.5 percent decrease. Nationally, the Association of American Veterinary Medical Colleges reports that the number and percentage of black graduates have declined in recent years. In 1988-89, there were 34 black graduates, representing 1.6 percent of the total. In contrast, Hispanic graduates increased in recent years. In 1988-89, there were 48 Hispanic graduates, representing 2.2 percent of the total.

Applicants, Enrollees, and Graduates: Florida

The Florida legislature authorized the University of Florida to establish a College of Veterinary Medicine in 1965. The founding dean was hired in 1971 and the charter class was admitted in Fall 1976. Construction of the Veterinary Medical Teaching Hospital was completed in 1978.

The University of Florida College of Veterinary Medicine reports that although the applicant-to-acceptance ratio has declined from four to one in 1987 to 2.7 in 1989, the ratio remains above the national ratio of 1.8 applicants to acceptances. Enrollments in the College of Veterinary Medicine have been stable; first-year openings have remained at 80 annually throughout the decade of the 1980s. First-year enrollment for women rose to 52 in 1989, representing 65 percent of the class, compared to 62.6 percent nationally. Between Fall 1987 and Fall 1989, first-year enrollments of black students declined from three (3.8%), to one (1.3%), and rose to two students (2.7%) in 1989. During the same time period, first-year Hispanic enrollments were stable at five students each year (6.3%).

In contrast to declining enrollments seen nationally, total enrollments at the College of Veterinary Medicine have remained relatively stable during the past three years (316 students in 1987, 312 in 1988, and 317 in 1989) (Table 11). The number of women has continued to rise; in 1989, 190 women were enrolled in the College of Veterinary Medicine, representing 59.9 percent of total enrollments, which is comparable to the national average. Total enrollments for black students rose from seven (2.2%) in 1987 to nine (2.8%) in 1989, also comparable to national averages. Total enrollments for Hispanic students rose from 18 (5.7%) in 1987, to 21 (6.7%) in 1988, to 22 (6.9%) in 1989, compared to 2.6 percent nationally in 1989.

TABLE 11

UNIVERSITY OF FLORIDA COLLEGE OF VETERINARY MEDICINE
TOTAL PREDOCTORAL ENROLLMENTS BY GENDER AND RACE/ETHNICITY
FALL 1987 TO FALL 1989

FALL ENROLLMENTS	1987		1988		1989	
	NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT
Total	**314**	**100**	**312**	**100**	**317**	**100**
Male	137	43.6	128	41.0	127	40.1
Female	177	56.4	184	59.0	190	59.9
Black	7	2.2	7	2.2	9	2.8
Hispanic	18	5.7	21	6.7	22	6.9
Asian and Pacific Islander	4	1.3	3	1.0	1	0.3

Source: Board of Regents, Count of Student Records Including Fee Waivers, 1990.

The College of Veterinary Medicine graduated 77 students in each year 1987-88 and 1988-89, and 74 students in 1989-90 (Table 12). The number of women graduates increased to 47 (61 percent of the total number of graduates) in 1988-89, and then decreased to 41 graduates (55.4%) in 1989-90, compared to 55 percent of graduates nationally in 1988-89. The number of black graduates has remained low; one black student (1.3%) graduated in 1987-88, no blacks graduated in 1988-89, and two black students (2.7%) graduated in 1989-90 (compared to 1.6 percent nationally in 1988-89). The number of Hispanic graduates increased from three graduates (3.9%) in 1987-88, to four (5.2%) in 1988-89, and to six (8.1%) in 1989-90 (compared to 2.2 percent nationally in 1988-89).

TABLE 12

UNIVERSITY OF FLORIDA COLLEGE OF VETERINARY MEDICINE
DEGREES GRANTED BY GENDER AND RACE/ETHNICITY
1987-88 TO 1989-90

	1987-88		1988-89		1989-90	
DEGREES GRANTED	NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT
Total	77	100	77	100	74	100
Male	38	49.4	30	39.0	33	44.6
Female	39	50.6	47	61.0	41	55.6
Black	1	1.3	--	--	2	2.7
Hispanic	3	3.9	4	5.2	6	8.1
Asian and Pacific Islander	1	1.3	3	3.9	--	--

Source: Board of Regents, Postsecondary Completions HEGIS/IPEDS, 1990.

Licensure and Continuing Education

Veterinarians are regulated through the Board of Veterinary Medicine, Department of Professional Regulation. Veterinarians are licensed under Chapter 474, Florida Statutes. To be eligible for licensure examination, candidates must have graduated from either a college of veterinary medicine accredited by the American Veterinary Medical Association Council on Education or a college of veterinary medicine listed in the American Veterinary Medical Association Roster of Veterinary Colleges of the World and must have obtained a certificate from the Education Commission for Foreign Veterinary Graduates. License renewal is required biennially through the Florida Board of Veterinary Medicine and is conditional upon the completion of 30 hours of continuing education.

Labor Market: Supply and Demand

The Florida Department of Professional Regulation reports that the supply of veterinarians in Florida, as measured by the total number of licenses to practice, has increased from 3,461 in 1985 to 6,176 in 1988-89. The number of new licenses granted, based on national and state examination scores, increased from 219 in 1982-83 to 426 in 1985-86, and decreased to 260 in 1989-90.

The Florida Department of Labor and Employment Security, Bureau of Labor Market Information projects that between 1987 and 2000, the number of veterinarians in Florida will increase by 2,808 (from 1,977 in 1987 to 4,785 in 2000). This represents an increase of 58.8 percent between 1987-2000, as compared to national projections for a 20.7 percent increase between 1988 and 2000. The Bureau of Labor Market Information projects a total of 164 average annual openings for employment in Florida between 1987 and 2000, based on the projection for expansion of 64 positions and 100 vacancies due to retirement, death, or other separation from the work force.

The State of Florida is supplied with veterinarians through the College of Veterinary Medicine at the University of Florida, residents receiving their education in other states, and in-migration. It appears from data pertaining to degrees granted, new licenses granted, and labor market projections, that the State will have a sufficient supply of veterinarians to meet projected demand.

IX. PHARMACY

The U.S. Department of Health and Human Services reports that pharmacy continues to find itself in the midst of change brought about by societal concerns on the use and misuse of drugs and the profession's response to those concerns. The pharmacist is increasingly the patients' source for drug information and expertise. The pharmacist is not only responsible for delivery of the drug but is involved in the selection, monitoring, and evaluation of the appropriate drug, as well as providing drug information to the patient and to other health professionals.

Pharmacy Education in Florida (1987) analyzed the state's responsibility for providing access to its citizens and the demand in Florida for pharmacy program graduates. The Commission recommended that enrollment should not be reduced in the two state colleges of pharmacy. Furthermore, despite considerable debate concerning the elimination of the baccalaureate degree, the Commission recommended that the Board of Regents maintain both the five-year baccalaureate and six-year doctor of pharmacy degree programs in the state colleges of pharmacy.

The Commission supported the initiatives of Florida Agricultural and Mechanical University and the University of Florida to increase access to pharmacy training opportunities for the residents of the Southeast region of the State and noted that the new Southeastern College of Pharmaceutical Sciences would provide additional geographic access to residents in that region. In addition, the Commission recognized Florida A & M University's College of Pharmacy as one of the few historically black colleges of pharmacy in the nation and its significant impact both nationally and regionally in producing minority pharmacists. The report further commended the University of Florida's College of Pharmacy for consistently exceeding the national average for minority enrollment for colleges of pharmacy.

Education

The U.S. Department of Health and Human Services reports that an entry level degree is required for U.S. citizens to become eligible to take a licensing examination. Schools and colleges of pharmacy provide two entry level degrees, a five-year baccalaureate or a six-year Doctor of Pharmacy (Pharm.D.). Of the 74 schools of pharmacy, seven offer the Pharm.D. as the only entry level degree, 31 offer both a baccalaureate and a Pharm.D. as an entry level degree, and 36 award only the baccalaureate degree as the entry level degree. In the State of Florida, there is a public college of pharmacy at Florida Agricultural and Mechanical University and at the University of Florida. In addition, there is one independent college of pharmacy at the Southeastern University of the Health Science.

Enrollees and Graduates: United States

The U.S. Department of Health and Human Services reports that enrollments in schools of pharmacy are continuing to increase after the sharp declines of the late 1970s and the early 1980s. In 1989-90 the 74 schools of pharmacy enrolled 23,013 students in the final three years of the entry level programs, a 20.5 percent increase since 1985-86 (Table 13). The third-to-last year enrollments (the first professional year) totaled 8,127 students in 1989-90, an increase of 10.6 percent over 1985-86. Entry level Pharm.D. degree program enrollments continue to increase. As a proportion of total entry degree enrollments, Pharm.D. enrollments have grown from 6.5 percent in 1980 to 15.6 percent in 1989-90.

The number and proportion of women enrolled in pharmacy programs continue to increase. In academic year 1989-90, 14,010 women were enrolled in the final three years of entry degree program. At the same time, a total of 18,210 women were enrolled in entry level programs, representing 61.6 percent of total enrollment (Table 13). In contrast, women accounted for 56.9 percent of total enrollments in 1985-86.

The proportion and number of minority students enrolled in recent years continue to grow modestly. The proportion of black students to total entry level pharmacy program enrollments in 1985-86 and in 1989-90 were 6.7 percent (Table 13). At the same time, Hispanic students decreased from 3.8 percent to 3.7 percent in 1989-90. Asian enrollment in entry level programs increased from 5.7 in 1985-86 to 9.2 percent in 1989-90. In the aggregate, total minority enrollment increased from 16.4 percent in 1985-86 to 19.8 percent in 1989-90.

TABLE 13

TOTAL ENROLLMENTS IN ENTRY LEVEL PHARMACY DEGREE PROGRAMS IN THE UNITED STATES: TOTAL NUMBERS AND PERCENTAGE BREAKDOWN BY SEX AND RACE 1985-86 AND 1987-88

TOTAL ENROLLMENT	1985-86	1989-90
Total Number	24,692	29,560
Percentage Women	56.9	61.6
Percentage Black	6.7	6.7
Percentage Hispanic	3.8	3.7
Percentage Asian	5.7	9.2

Source: **American Journal of Pharmaceutical Education**, Enrollments in Schools and Colleges of Pharmacy, 1989-90.

Pharmacy schools awarded 5,721 baccalaureate and 836 entry level Pharm.D. degrees for a total of 6,557 degrees in 1988-89, representing a 13 percent increase over the 5,800 degrees awarded in 1985-86. In 1988-89, 3,932 women graduated, representing 60 percent of the total, compared with 3,152 in 1985-86 and 2,648 in 1977. Three hundred ten black students (4.7%) received entry level pharmacy degrees, a 9.9 percent increase in the number of black students since 1987-88. Of the 6,557 graduates in 1988-89, 249 Hispanic students (3.8%) graduated, a slight decrease in the proportion recorded the previous year. Asian students received 454 degrees (6.9%) in 1988-89, a one year increase of 22 percent.

Enrollees and Graduates: Florida

The University of Florida and Florida Agricultural and Mechanical University pharmacy programs offer both the baccalaureate and Pharm.D. entry level options, and each institution provides clinical experiences in the South Florida area. Florida A & M University has implemented a returning practitioner program, which is referred to as the External Pharm.D. Program in the Miami area.

Since Fall 1985, when total enrollments in the two state university programs were 543 for upper level baccalaureate and Pharm.D. programs combined, enrollments have fluctuated. In Fall 1987, enrollments decreased to 447, increased to 512 in Fall 1988, and decreased again to 500 in Fall 1989 (Table 14). As a proportion of total entry degree enrollments, Pharm.D. enrollments increased from 13.6 percent in 1985 to 19.9 percent in 1987 and have since decreased to 17.6 percent in 1989 (compared to 12.7 percent nationally in 1987) (Table 15).

The number and proportion of women in the state university programs also fluctuated (Tables 14 and 15). In Fall 1987, 274 women were enrolled in upper level baccalaureate and Pharm.D. programs (61.3 percent of the total); in Fall 1988, the number of women enrolled increased to 318 (62.1%); and in Fall 1989, the number of women enrolled decreased to 302 (60.4%), compared to 60.0 percent nationally. The proportion of black students increased from 24.2 percent in 1987 (108 students) to 30.8 percent in 1989 (154 students). In 1989, 87.6 percent of the black students in state university pharmacy programs were enrolled at Florida A & M University. The number and percentage of Hispanic students also fluctuated from 7.2 percent (32 students) in 1987, to 5.1 percent (26 students) in 1988, to 5.8 percent (36 students) in 1989. In 1989, 89.7 percent of the Hispanic students in state university pharmacy programs were enrolled at the University of Florida.

Since Fall 1985, when the number of degrees awarded in the two state university programs was 142, the number of graduates has fluctuated (Tables 16 and 17). In 1987-88, degrees awarded decreased to 93, then increased to 149 in 1988-89, and decreased slightly to 146 in 1989-90. As a proportion of degrees awarded, Pharm.D. degrees increased from 17.6 percent in 1985-86 to 53.8 percent in 1987-88, and then decreased to 33.6 percent by 1989-90 (compared to 12.7 percent nationally in 1988-89). The percentage of degrees awarded to women increased from 61.3 percent in 1987-88, to 66.4 percent in 1988-89, and then decreased to 60.3 percent in 1989-90.

TABLE 14

STATE UNIVERSITY SYSTEM COLLEGES OF PHARMACY
TOTAL UPPER LEVEL BACCALAUREATE ENROLLMENTS BY GENDER AND RACE/ETHNICITY
FALL 1987 TO FALL 1989

FALL ENROLLMENTS	1987 NUMBER	1987 PERCENT	1988 NUMBER	1988 PERCENT	1989 NUMBER	1989 PERCENT
Total	358	100	412	100	412	100
Male	124	34.6	145	35.2	154	37.4
Female	234	65.4	267	64.8	258	62.6
Black	83	23.2	118	28.6	134	32.5
Hispanic	26	7.3	25	6.1	24	5.8
Asian and Pacific Islander	30	8.4	31	7.5	31	7.5

Source: Board of Regents, Count of Student Records Including Fee Waivers, 1990.

TABLE 15

STATE UNIVERSITY SYSTEM COLLEGES OF PHARMACY
TOTAL PHARM.D. ENROLLMENTS BY GENDER AND RACE/ETHNICITY
FALL 1987 TO FALL 1989

FALL ENROLLMENTS	1987 NUMBER	1987 PERCENT	1988 NUMBER	1988 PERCENT	1989 NUMBER	1989 PERCENT
Total	89	100	100	100	88	100
Male	49	55.1	49	49.0	44	50.0
Female	40	44.9	51	51.0	44	50.0
Black	25	28.1	30	30.0	20	22.7
Hispanic	6	6.7	1	1.0	4	4.5
Asian and Pacific Islander	2	2.2	10	10.0	5	5.7

Source: Board of Regents, Count of Student Records Including Fee Waivers, 1990.

TABLE 16

STATE UNIVERSITY SYSTEM COLLEGES OF PHARMACY BACCALAUREATE DEGREES GRANTED BY GENDER AND RACE/ETHNICITY 1987-88 TO 1989-90

DEGREES GRANTED	1987-88 NUMBER	1987-88 PERCENT	1988-89 NUMBER	1988-89 PERCENT	1989-90 NUMBER	1989-90 PERCENT
Total	43	100	87	100	97	100
Male	18	41.9	29	33.3	37	38.1
Female	25	58.1	58	66.7	60	61.9
Black	18	41.9	24	27.6	34	35.1
Hispanic	4	9.3	6	6.9	7	7.2
Asian and Pacific Islander	-	--	-	--	1	1.0

Source: Board of Regents, Postsecondary Completions HEGIS/IPEDS, 1990.

TABLE 17

STATE UNIVERSITY SYSTEM COLLEGES OF PHARMACY PHARM.D. DEGREES GRANTED BY GENDER AND RACE/ETHNICITY 1987-88 TO 1989-90

DEGREES GRANTED	1987-88 NUMBER	1987-88 PERCENT	1988-89 NUMBER	1988-89 PERCENT	1989-90 NUMBER	1989-90 PERCENT
Total	50	100	62	100	49	100
Male	18	36.0	21	33.9	21	42.9
Female	32	64.0	41	66.1	28	57.1
Black	7	14.0	15	24.2	6	12.2
Hispanic	9	18.0	6	9.7	3	6.1
Asian and Pacific Islander	-	--	-	--	8	16.3

Source: Board of Regents, Postsecondary Completions HEGIS/IPEDS, 1990.

The number of degrees awarded to black students increased from 25 (26.9%) in 1987-88 to 40 (27.4%) in 1989-90 (compared to 5.2 percent nationally in 1986-87). In 1989-90, all of the black graduates from the state university pharmacy programs received their degrees from Florida A & M University. Both the number and percentage of degrees awarded to Hispanic students decreased from 14.0 percent (13 students) in 1987-88 to 6.7 percent (10 students) in 1989-90 (compared to 4.4 percent nationally in 1986-87). In 1989-90, 80.0 percent of the Hispanic graduates from the state university pharmacy programs received their degrees from the University of Florida.

The College of Pharmacy at Southeastern University of the Health Sciences enrolled its first class in Fall 1987 and implemented a returning practitioner program in Spring 1988 for pharmacists holding baccalaureate degrees who desired to work toward the Pharm.D. degree. In 1987, 49 students were enrolled in the charter class. Subsequent classes increased in size; in 1990, 100 students entered the pharmacy program. The first class graduated in Spring 1990 with 30 degrees awarded. Adding the numbers for the degrees awarded in both the public and independent colleges of pharmacy, 176 pharmacists graduated from Florida institutions in 1989-90.

Licensure and Continuing Education

Pharmacists are regulated through the Board of Pharmacy, Department of Professional Regulation. Pharmacists are licensed under Section 465.007, Florida Statutes. To be eligible for licensure examination, candidates must have graduated from an accredited school of pharmacy and submitted proof of completion of an internship program approved by the board. Licensure renewal is required biennially through the Florida Board of Pharmacy and is conditional upon completion of 15 hours of continuing education for each calendar year.

Labor Market: Supply and Demand

The Florida Department of Professional Regulation reports that the supply of pharmacists in Florida, as measured by the total number of licenses to practice, has increased from 6,768 in 1971 to 15,658 in 1989. There were 9,776 Florida resident pharmacists with active licenses in 1990. The number of new licenses granted, based on national and state examination scores, increased from 654 in 1985-86 to 1,020 in 1989-90. The two public schools of pharmacy in Florida graduate approximately 150 pharmacists each year, and in 1989-90 the first class of 30 students graduated from Southeastern. The number of pharmacists per 100,000 population in Florida was estimated to be approximately 76 in 1988, compared to 63.8 nationally.

The Florida Department of Labor and Employment Security, Bureau of Labor Market Information projects that between 1987 and 2000, the number of pharmacists in Florida will increase by 4,356 pharmacists (from 9,484 in 1987 to 13,840 in 2000). This represents an increase of 45.9 percent between 1987 and 2000, as compared to national projections for a 27 percent increase between 1988 and 2000. The Bureau of Labor Market Information projects a total of 1,013 average annual openings for employment in Florida between 1987 and 2000, based on the projection for expansion of 335 positions and 678 vacancies due to retirement, death, or other separation from the work force.

Supply projections for pharmacists in Florida suggest that projected demand will be met for the rest of the decade. Favorable supply projections include graduating approximately 200 Florida-educated pharmacists per year, granting approximately 1,000 new licenses annually, increasing employability conditions in Florida compared to the nation as a whole, which should encourage in-migration, and having a higher than average ratio of pharmacists per 100,000 population currently in the State.

X. PUBLIC HEALTH EDUCATION

In the **Seventh Report to the President and Congress on the Status of Health Personnel in the United States**, the U.S. Department of Health and Human Services states that professional categories in public health are diverse, imprecisely delineated, and frequently overlapping. Major categories of public health include environmental health personnel and health educators. Specialty areas include, but are not limited to, epidemiologists; biostatisticians; several environmental and occupational health specialties; public health nutritionists, nurses, physicians, and veterinarians; and administrators for health agencies, hospitals, health maintenance organizations and nursing homes. Public health personnel are employed in such diverse settings as government agencies, foundations, and private companies. The diversity in professional categories and settings contributes to the absence of adequate, timely data on the professionals employed in public health.

The Commission examined public health in previous reports: **A Study of the Need for New and Expanded Programs in Public Health in Florida** (1983), **Comprehensive Health Professions Plan Review for Florida** (1988), and **Public Health Education in Florida** (1989). The first study looked at the need for public health professionals in the State as well as the research and public service needs of county and state health departments. The Commission analyzed the extent of need for professional training in public health and public health problems facing the State. The report described the scope of public health activities, the labor market needs in the professions, the organization of public health education, public health problems in Florida, and the educational programs offered in the State. Recommendations focused on the need for further educational programs, the need for research specific to Florida's public health environment, and the need for statewide coordination in offering extension education and establishing research priorities. The Commission recommended establishing a College of Public Health at the University of South Florida and providing a cooperative degree program in Orlando in concert with the University of Central Florida. The Commission also recommended against increasing the number of baccalaureate programs related to public health offered in the State; however, it encouraged Regional Coordinating Councils to review the need for public health-related vocational programs in conjunction with local, county, and private health agencies.

When public health education was studied again in 1988, the Commission found that, although undergraduate degrees are awarded in related areas, graduate education through public health programs is the primary source of personnel prepared extensively in public health. Graduate programs were available at the University of South Florida, Florida International University, and the University of Miami. These programs experienced significant enrollment growth during the mid-1980s, yet demand for graduates was expected to exceed supply. Issues addressed in this report focused on education and government collaboration, the public health labor market, program access, minority participation, and research in public health. The report concluded that an organized effort was needed to coordinate the public health education needs of the State, research interests, and continuing education needs of the public health work force. The Commission called for the collection of adequate and timely information on the supply of and demand for public health workers and continued monitoring of program access to both ensure adequate service and to project future geographic access to graduate education in public health concentrations. Concerted efforts to improve the distribution of minority groups in all of the education programs and to increase their overall representation in proportion to the total enrollment were encouraged.

Education

Although undergraduate degrees are awarded in related areas, graduate education through public health programs is the primary source of personnel prepared extensively in public health. In 1989, there were 24 accredited schools of public health in the nation, including eight independent and 16 public universities. In addition, numerous other programs are offered at other public and independent postsecondary institutions and contribute to the overall supply of public health personnel.

Enrollees and Graduates: United States

In 1987-88, the programs enrolled 10,761 students (compared to 7,942 students in 1985) and graduated more than 3,400 students (compared to 2,703 graduates in 1984-85). U.S. Department of Health and Human Services' data reveal that enrollments are increasing, 60 percent of the student body is female, and 19 percent of the U.S. students are minorities. Two-thirds of the students are enrolled in four program areas--health services administration (28 percent), epidemiology (15 percent), environmental sciences (13 percent), and behavioral sciences (10 percent). Approximately 27 percent of the U.S. graduates were physicians, dentists, and nurses in 1986-87. Nearly one-third of public health students are enrolled part-time.

Enrollees and Graduates: Florida

The first Florida graduate program in public health was offered at the University of Miami with the master of science in public health degree program's charter class in 1980. At present, graduate-level degree programs for the master's and doctorate in public health are offered in the State. Master's degree programs are available at the University of South Florida and through a joint program between Florida International University and the University of Miami. Florida's only doctoral program in public health is located at the University of South Florida. Other institutions in the State offer courses in related fields.

Total enrollments in the two state university master-level public health programs fluctuated in the late-1980s and ended the decade at 196 in Fall 1989 (Table 18). The proportion of women and Hispanics increased to 71.4 and 13.3 percent respectively in Fall 1989, while the proportion of blacks fluctuated between approximately 11 and 14 percent.

TABLE 18

STATE UNIVERSITY SYSTEM PUBLIC HEALTH PROGRAMS
TOTAL MASTER LEVEL ENROLLMENTS BY GENDER AND RACE/ETHNICITY
FALL 1987 TO FALL 1989

FALL ENROLLMENTS	1987 NUMBER	 PERCENT	1988 NUMBER	 PERCENT	1989 NUMBER	 PERCENT
Total	244	100	257	100	196	100
Male	86	35.2	75	29.2	56	28.6
Female	158	64.8	182	70.8	140	71.4
Black	30	12.3	28	10.9	28	14.3
Hispanic	18	7.4	21	8.2	26	13.3
Asian and Pacific Islander	8	3.3	6	2.3	7	3.6

Source: Board of Regents, Count of Student Records Including Fee Waivers, 1990.

The number of master's degrees granted by the public programs increased to 78 in 1988-89 and then decreased to 58 in 1989-90 (Table 19). The proportion of degrees awarded to women peaked in 1988-89 at 71.8 percent (56 women) and then decreased slightly to 70.7 percent (41 women) in 1989-90. Proportions of black and Hispanic graduates also fluctuated in the late-1980s with the proportion of black graduates peaking in 1989-90 at 8.6 percent and the proportion of Hispanics in 1988-89 at 11.5 percent. Minority enrollments and graduations are higher at Florida International University than at the University of South Florida. The number of master's degrees granted by the University of Miami in 1989-90 was 16, bringing the total number of master's degrees granted in the State to 74 for 1989-90. Although three doctoral degrees in public health were awarded in 1987-88, none were granted in the two subsequent years.

TABLE 19

STATE UNIVERSITY SYSTEM PUBLIC HEALTH PROGRAMS
MASTER DEGREES GRANTED BY GENDER AND RACE/ETHNICITY
1987-88 TO 1989-90

DEGREES GRANTED	1987-88 NUMBER	1987-88 PERCENT	1988-89 NUMBER	1988-89 PERCENT	1989-90 NUMBER	1989-90 PERCENT
Total	49	100	78	100	58	100
Male	16	32.7	22	28.2	17	29.3
Female	33	67.3	56	71.8	41	70.7
Black	4	8.2	5	6.4	5	8.6
Hispanic	4	8.2	9	11.5	4	6.9
Asian and Pacific Islander	-	--	-	--	1	1.7

Source: Board of Regents, Postsecondary Completions HEGIS/IPEDS, 1990.

Licensure and Continuing Education

Public health is not regulated as an independent profession, however, many public health personnel are also health care providers, e.g., physicians, dentists, and nurses who are licensed through their respective boards. Continuing education serves to permit the renewal of licenses for physicians, dentists, and nurses, to supplement previous training, and to keep public health personnel current as health care needs for the State evolve.

Labor Market: Supply and Demand

The analysis of the public health labor market is severely handicapped by lack of data defining the public health work force and estimating personnel supply and requirements. In the absence of hard data, the U.S. Department of Health and Human Services relies on the judgement of experts who declare that severe problems exist in public health education and practice. Nationally, shortages of public and community health personnel exist in the specialties of epidemiologists, biostatisticians, several environmental and occupational health specialties, public health nutritionists, public health nurses, and physicians trained in public and preventive medicine. Compounding the labor market problem, many health professionals working in public health settings have not received the benefit of graduate preparation or continuing education in public health.

In Florida, the Department of Health and Rehabilitative Services' State Health Office provides leadership, policy, and administrative direction and evaluation for public health activities and services. The state's public health system includes programs providing activities that are categorized into the service levels of public health service, personal health services, and primary care services. In January 1991, the Florida public health work force totaled approximately 3,950 professional health care positions. Although no comprehensive labor markert information is available on the public health work force for Florida, a number of specialties have been identified as having high demand, including epidemiologists, public health nurses and physicians, and public health administrators. In October 1990, the Department of Health and Rehabilitative Services reported that of the 551 FTE physician positions in the state system, there were 108 vacancies (approximately 20 percent) and of the 1,732 FTE nurse positions, there were 383 vacancies (approximately 22 percent).

During the 1980s, access to graduate programs in public health increased and strengthened the state's public health system by increasing the number of personnel in this field with graduate preparation. The number of degrees granted in public health increased from three in 1984 to 74 in 1989-90. Although recent data are not available on the overall needs of the state's public health system for personnel with graduate preparation in public health, the Department of Health and Rehabilitative Services' Office of Recruitment and Retention reaffirmed that the need for new personnel with graduate preparation and for enhancing the education of current personnel remains unmet.

XI. NURSING EDUCATION

The U.S. Department of Health and Human Services reports that nursing personnel are the largest group within the health care system. Registered nurses, the largest group of nursing personnel, serve in leadership roles, providing administration, supervision, and teaching, as well as direct patient care throughout the health care system. Licensed practical nurses provide direct patient care under supervision. Nursing assistants provide ancillary support to nurses. Nursing is a dynamic and complex profession as illustrated by the varied specialty areas, diverse academic preparations, types of licensure, and employment sites. This profile focuses on registered nursing, licensed practical nursing, and nurse assisting preparation and practice. Past Commission studies on nursing are summarized below.

In **A Study of the Need for New and Expanded Programs in Nursing in Florida** (1983), the Commission was originally concerned with the severe shortage of nurses in acute care hospitals and nursing homes. The Commission found that the shortage problem was subsiding, however, due in part to economic conditions that encouraged nurses to seek employment and in part to initiatives taken by some health care employers to make nursing practice more attractive in their institutions. The nursing labor market and the evolving role of nurses in a changing health care system indicated that both the demand for and the supply of nurses were increasing at a remarkable pace. Some of the nursing shortage could be attributed to dissatisfaction with the profession. As a result, some nurses who were available were unwilling to work in the field. The study identified issues in the nursing profession that concern education, articulation, utilization patterns, and compensation patterns. Attention was concentrated on developing long-range solutions to the problems that cause episodic crises in the supply of nurses and on improving the quality of nursing education and practice Florida.

The Commission submitted a series of recommendations designed to help develop a more stable and sound educational base for the nursing profession in the State. Recommendations called for nursing education to remain more responsive to the needs of practicing nurses and for the health care industry to help improve the status and attractiveness of nursing as a career choice. Other recommendations called for improving information collection on the nursing profession and on future demand, targeting expansion in the production of nurses toward specific goals and needs, encouraging employers to continue to improve nursing employment opportunities and conditions, considering the state's nursing educational program as a professional development system that facilitates articulation and career laddering, and enhancing the agreements between educational and health care delivery institutions.

The Commission's report, **Nursing Education in Florida** (1988), identified a number of issues, including labor market requirements, articulation and career ladder provisions, financial aid adequacy, entry-to-practice routes, and minority participation. The study recommended against establishing any new registered nursing or graduate nursing programs but also requested that student demand continue to be monitored. Strategies were suggested to increase the student supply for nursing programs, to improve the image of the profession, and to encourage the return of inactive nurses to the work force. The Commission reaffirmed the fundamental roles of both the associate degree and basic baccalaureate nursing programs in providing quality preparation for registered nurse licensure and supported the existing educational requirements for state licensure of licensed practical nurses and registered nurses. In addition, recommendations were made to continue to strengthen the processes of articulation and career laddering. As a variety of financial assistance programs were available for nursing students, recommendations encouraged the promotion of aid awareness to attract potential nursing students. Furthermore, the Commission suggested strategies to increase male, black, and Hispanic participation and completion rates in nursing programs.

Education

Registered nurses and licensed practical nurses are prepared in formal education programs, whereas nursing assistants are primarily trained on-the-job or in relatively short-term educational courses. Preparation to become a registered nurse (RN) may be obtained in various settings, through programs that vary in length, resulting in different credentials upon completion. To obtain licensure as a registered nurse, all graduates take the same licensing examination. Career opportunities for registered nurses are broader for holders of the baccalaureate degree, compared with those holding an associate degree. For example, practicing in the armed services as a commissioned officer, in veteran's administration hospitals, with the national public health services, and advancing to graduate school all require completion of the baccalaureate degree. In addition, salary and career advancement opportunities are typically enhanced with the baccalaureate degree.

Of the 1,443 nursing education programs leading to RN licensure in the nation in Fall 1988, 12 percent were diploma programs, 55 percent were associate degree programs, and 33 percent were baccalaureate programs (including six master's and two doctoral programs leading to RN licensure). These figures represent decreases in the total number of programs and the number of diploma programs but increases in the number of associate and baccalaureate level programs since 1984 (the peak year for number of programs in recent years).

Enrollees and Graduates: United States

First-year enrollments in programs preparing students for RN licensure declined from a peak of 123,824 students in 1983-84 to 90,693 students in 1986-87 and then increased to 94,594 in 1987-88. The largest increase occurred in associate degree programs. Graduation totals for 1987-88 decreased to 64,915, reflecting the decreases in enrollment experienced before 1987-88. Data from the National League for Nursing reveal that in 1986-87 approximately seven percent of first-year enrollments were men, and almost 17 percent of newly admitted students were from racial/ethnic minority backgrounds. Black, non-Hispanic students represented 10.9 percent of total admittees. Associate degree programs enrolled a greater percentage of men and minorities than diploma or baccalaureate programs.

Licensed practical nursing programs, which are generally 12 months in length, are located in adult vocational education settings and community colleges. In 1987 there were 1,035 licensed practical nursing programs nationally, a 17 percent decrease since 1984. The number of graduates also fell from 44,654 in 1983-84 to 27,285 in 1986-87, representing a 39 percent decrease.

Enrollees and Graduates: Florida

Currently, the State Board of Community Colleges, in conjunction with the Division of Adult, Vocational, and Community Education and the Board of Regents, is conducting a Level III Program Review on nursing education in Florida. The review process is designed to identify trends, analyze consequences, and develop recommendations concerning nursing education. The findings and recommendations of this review will provide pertinent information concerning the field of nursing in Florida, and it is anticipated that the findings will be available within the next year.

Registered Nursing. Within the State of Florida in Fall 1989, there were 43 registered nurse preparation programs, including one at each of the nine public universities, 25 community colleges, eight independent colleges and universities, and one diploma program. Total enrollments in public community college and university registered nursing programs increased from 7,534 in 1987-88 to 9,079 in 1989-90, an increase of 20.5 percent (Table 20 and 21). During this period the proportion of male students increased from 8.0 percent in 1987-88 to 10.9 percent in 1989-90.

Although diploma program completions have decreased since the mid-1980s, associate degree programs regained previous levels and baccalaureate programs rose above previous levels, following declines. Total degree completions in the public sector rose from 2,403 in 1987-88 to 2,754 in 1989-90 with baccalaureate degrees, accounting for approximately 24 percent of total degrees (Tables 21 and 22). In the independent sector in 1989-90, 66 students completed the diploma program, and 273 students were granted degrees from independent colleges and universities. The total number of RN completions was 3,073 for 1989-90, compared to 3,053 in 1985-86.

TABLE 20

STATE UNIVERSITY SYSTEM REGISTERED NURSING PROGRAMS
TOTAL UPPER LEVEL BACCALAUREATE ENROLLMENTS BY GENDER AND RACE/ETHNICITY
FALL 1987 TO FALL 1989

FALL ENROLLMENTS	1987		1988		1989	
	NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT
Total	1,668	100	1,593	100	1,749	100
Male	87	5.2	101	6.3	128	7.3
Female	1,581	94.8	1,492	93.7	1,621	92.7
Black	184	11.0	199	12.5	249	14.2
Hispanic	101	6.1	90	5.6	113	6.5
Asian and Pacific Islander	28	1.7	29	1.8	45	2.6

Source: Board of Regents, Count of Student Records Including Fee Waivers, 1990.

In recent years, the number and percentage of men completing registered nursing programs generally has been rising (8.9 percent in 1989-90) (Tables 21 and 22). Degree completions by black students increased from 239 in 1987-88 to 300 in 1989-90, representing approximately 11 percent of total degrees granted. Hispanic completions represent approximately six percent of the total completions in 1989-90.

TABLE 21

FLORIDA PUBLIC COMMUNITY COLLEGE REGISTERED NURSING PROGRAMS TOTAL ENROLLMENTS AND DEGREES GRANTED BY GENDER AND RACE/ETHNICITY 1987-88 TO 1989-90

	1987-88		1988-89		1989-90	
	NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT
Total Enrollments	5,866	100	6,428	100	7,330	100
Male	517	8.8	631	9.8	859	11.7
Female	5,349	91.2	5,797	90.2	6,471	88.3
Black	836	14.3	881	13.7	968	13.2
Hispanic	337	5.7	366	5.7	410	5.6
Asian and Pacific Islander	82	1.4	96	1.5	106	1.4
Degrees Granted	1,858	100	1,944	100	2,085	100
Male	145	7.8	144	7.4	197	9.4
Female	1,713	92.2	1,800	92.6	1,888	90.6
Black	187	10.1	234	12.0	219	10.5
Hispanic	85	4.6	88	4.5	125	6.0
Asian and Pacific Islander	17	0.9	36	1.9	22	1.1

Source: State Board of Community Colleges (AA1-A File), 1990.

TABLE 22

STATE UNIVERSITY SYSTEM REGISTERED NURSING PROGRAMS BACCALAUREATE DEGREES GRANTED BY GENDER AND RACE/ETHNICITY 1987-88 TO 1989-90

DEGREES GRANTED	1987-88 NUMBER	1987-88 PERCENT	1988-89 NUMBER	1988-89 PERCENT	1989-90 NUMBER	1989-90 PERCENT
Total	545	100	616	100	669	100
Male	29	5.3	34	5.5	49	7.3
Female	516	94.7	582	94.5	620	92.7
Black	52	9.5	50	8.1	81	12.1
Hispanic	36	6.6	39	6.3	39	5.8
Asian and Pacific Islander	--	--	--	--	12	1.8

Source: Board of Regents, Postsecondary Completions HEGIS/IPEDS, 1990.

Licensed Practical Nursing. Licensed practical nursing programs are offered in Florida's community colleges and vocational centers. During the past three years, the total number of program completions increased above levels recorded in the mid-1980s to reach 1,294 in 1987-88 and 1,543 in 1989-90. In 1989-90 the percentage of completions reported in community college programs rose to 19.6 percent of the total (Tables 23 and 24).

The percentage of men enrolled in and graduating from licensed practical nursing programs continued to rise from levels recorded in the mid-1980s (Tables 23 and 24). Although, the percentage of enrolled blacks fluctuated during the past three years, the percentage of blacks graduating increased from 23.0 percent in 1987-88 to 25.1 percent in 1989-90. The percentage of Hispanics enrolled and graduating increased slightly but remains low.

TABLE 23

FLORIDA PUBLIC COMMUNITY COLLEGE PRACTICAL NURSING PROGRAMS
TOTAL CERTIFICATE AND DIPLOMA ENROLLMENTS
AND COMPLETIONS BY GENDER AND RACE/ETHNICITY
1987-88 TO 1989-90

	1987-88		1988-89		1989-90	
	NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT
Total Enrollments	556	100	767	100	860	100
Male	35	6.3	69	9.0	96	11.2
Female	521	93.7	698	91.0	764	88.8
Black	127	22.8	167	21.8	143	16.6
Hispanic	8	1.4	20	2.6	25	2.7
Asian and Pacific Islander	8	1.4	11	1.4	14	1.6
Program Completions	235	100	234	100	302	100
Male	11	4.7	12	5.1	36	11.9
Female	224	95.3	222	94.9	266	88.1
Black	41	17.4	47	20.1	43	14.2
Hispanic	1	0.4	7	3.0	3	1.0
Asian and Pacific Islander	2	0.9	4	1.7	4	1.3

Source: State Board of Community Colleges (AAI-A File), 1990.

TABLE 24

FLORIDA DISTRICT VOCATIONAL CENTER PRACTICAL NURSING PROGRAMS TOTAL CERTIFICATE AND DIPLOMA PROGRAM ENROLLMENTS AND COMPLETIONS BY GENDER AND RACE/ETHNICITY
1987-88 TO 1989-90

	1987-88		1988-89		1989-90	
	NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT
Total Enrollments	8,914	100	16,720	100	13,918	100
Male	759	8.5	1,713	10.2	2,154	15.5
Female	8,155	91.5	15,007	89.8	11,764	84.5
Black	1,626	18.2	2,860	17.1	2,649	19.0
Hispanic	218	2.4	380	2.3	478	3.4
Asian and Pacific Islander	116	1.3	211	1.3	229	1.6
Program Completions	1,059	100	1,154	100	1,241	100
Male	74	7.0	83	7.2	111	8.9
Female	985	93.0	1,071	92.8	1,130	91.1
Black	257	24.3	298	25.8	344	27.7
Hispanic	24	2.3	22	1.9	42	3.8
Asian and Pacific Islander	13	1.2	13	1.1	13	1.0

Source: Division of Vocational, Adult, and Community Education, ESE 531, Final Class Reports, 1990.

Nurse Assisting. Nurse assisting programs are also offered through public community colleges and vocational centers. Total completions for the past three years were 2,280 in 1987-88, 1,542 in 1988-89, and 2,122 in 1989-90. The percentage of community college completions to total completions fluctuated from 20 percent in 1987-88, to 36 percent in 1988-89, to 25 percent in 1989-90. The ratio of completions to enrollments was higher in community college programs (from 65 to 75 percent) compared to vocational center program ratios (from 18 to 25 percent) during the past three years (Tables 25 and 26).

The percentages of men, blacks, and Hispanics enrolled in and graduating from nurse assisting programs were higher in vocational center programs than in community college programs (with the execption of men graduating in 1987-88). The percentages of blacks were above population parity levels during the past three years (Tables 25 and 26).

TABLE 25

FLORIDA PUBLIC COMMUNITY COLLEGE NURSE ASSISTING PROGRAMS TOTAL CERTIFICATE PROGRAM ENROLLMENTS AND COMPLETIONS BY GENDER AND RACE/ETHNICITY 1987-88 TO 1989-90

	1987-88		1988-89		1989-90	
	NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT
Total Enrollments	631	100	846	100	793	100
Male	65	10.3	66	7.8	63	7.9
Female	566	89.7	780	92.2	730	92.1
Black	178	28.2	347	41.0	256	32.3
Hispanic	29	4.6	23	2.7	18	2.3
Asian and Pacific Islander	3	0.5	11	1.3	4	0.5
Program Completions	472	100	552	100	538	100
Male	49	10.4	39	7.1	35	6.5
Female	423	89.6	513	92.9	503	93.5
Black	130	27.5	219	39.7	157	29.2
Hispanic	24	5.1	12	2.2	7	1.3
Asian and Pacific Islander	3	0.6	4	0.7	3	0.6

Source: State Board of Community Colleges (AA1-A File), 1990.

TABLE 26

FLORIDA DISTRICT VOCATIONAL CENTER NURSE ASSISTING PROGRAMS
TOTAL CERTIFICATE PROGRAM ENROLLMENTS AND COMPLETIONS
BY GENDER AND RACE/ETHNICITY
1987-88 TO 1989-90

	1987-88		1988-89		1989-90	
	NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT
Total Enrollments	7,169	100	5,484	100	6,568	100
Male	696	9.7	779	14.2	779	11.9
Female	6,473	90.3	4,705	85.8	5,789	88.1
Black	3,074	42.9	2,560	46.7	2,736	41.7
Hispanic	650	9.1	505	9.2	735	11.2
Asian and Pacific Islander	115	1.6	56	1.0	98	1.5
Program Completions	1,808	100	990	100	1,584	100
Male	137	7.6	77	7.8	125	7.9
Female	1,671	92.4	913	92.2	1,459	92.1
Black	687	38.0	433	43.7	650	41.0
Hispanic	120	6.6	112	11.3	181	11.4
Asian and Pacific Islander	25	1.4	9	1.0	24	1.5

Source: Divisions of Vocational, Adult, and Community Education, ESE 531, Final Class Reports, 1990.

Licensure and Continuing Education

Registered nurses and licensed practical nurses are regulated by the Department of Professional Regulation, Board of Nursing, under Chapter 464, Florida Statutes. Licensure may be obtained through examination or endorsement for nurses holding licenses from other states with requirements for licensure at least as stringent as Florida's requirements. Licensure renewal is required biennially through the Florida Board of Nursing and is conditional upon the completion of 30 hours of continuing education each renewal period. Nursing assistants are not licensed by the State.

Labor Market: Supply and Demand

The Florida Department of Professional Regulation reports that the supply of registered and practical nurses in Florida, as measured by the total number licensed to practice, has increased from 49,728 in 1975 to 112,395 in 1989 for registered nurses and from 22,731 in 1975 to 41,828 in 1989 for licensed practical nurses. The number of new licenses granted in 1989-90, based on national and state examination scores, increased almost four percent from the previous year to 3,257 for registered nurses and almost 18 percent to 2,268 for licensed practical nurses.

The **1989 Florida Health Care Atlas** reported that the number of nurses per 100,000 in Florida was 881.4 registered nurses and 352.5 licensed practical nurses in 1988. Data from the U.S. Department of Health and Human Services reveal that when converted to full-time-equivalent figures, Florida recorded 668 registered nurses per 100,000 population, the same as the national average in 1988. The Department cautions that while these ratios can be used for comparative purposes, they are not a true measure of nursing services provided to the population because of geographic maldistribution. The **Atlas** states that the majority of counties reporting low RN ratios are rural counties in North Florida, and the counties experiencing the highest ratios are found near colleges with nursing programs. In addition to variation in the numbers and distribution of nurses, there is variation in the proportion of total nurses employed in nursing. Data from the U.S. Department of Health and Human Services reveal that in 1988, 80 percent of the national nurse population was employed in nursing, 78.7 percent in the south Atlantic region, and 78.4 percent in Florida.

The Florida Department of Labor and Employment Security, Bureau of Labor Market Information, projects that between 1987 and 2000 the number of registered nurses in Florida will increase by 52,193 (from 77,199 in 1987 to 129,392 in 2000); the number of licensed practical nurses will increase by 27,532 (from 52,193 in 1987 to 79,725 in 2000); and the number of nurse assistants will increase by 35,538 (from 42,662 in 1987 to 78,200 in 2000). These numbers represent increases between the years 1987 and 2000 of 67.6 percent for registered nurses (compared to national projections for 39 percent between 1988 and 2000), increases of 78.8 for licensed practical nurses (compared to 37 percent nationally), and increases of 83.3 percent for nursing assistants (compared to 32 percent nationally).

The Bureau of Labor Market Information also projects the average annual openings for employment in Florida between 1987 and 2000, based on the projection for expansion of the number of positions and vacancies due to retirement, death, or other separation from the work force. For registered nurses, the Bureau projects 4,015 annual openings due to growth and 3,501 due to separation, for a total of 7,517 average annual openings in Florida between 1987 and 2000. For licensed practical nurses, the Bureau projects 2,118 annual openings due to growth and 1,934 due to separation, for a total of 4,052 average annual openings in Florida between 1987 and 2000. For nursing assistants, the Bureau projects 2,734 annual openings due to growth and 2,478 due to separation, for a total of 5,212 average annual openings in Florida between 1987 and 2000.

In 1988, the Secretary of the Department of Health and Human Services appointed a Commission on Nursing to review the national nursing shortage. The Commission found the shortage of RNs to be real, widespread, and of significant magnitude. The shortage was primarily the result of an increase in demand as opposed to a contraction of supply. Shortages were noted throughout the health care system. Anticipated changes in health care delivery, as well as trends in nursing and in characteristics of the population to be served, will cause future requirements for registered nurses to increase. Population characteristics present in Florida, such as high infant mortality rates, high proportion of elderly, and higher than average incidence of HIV/AIDS, increase the demand for nurses compared to national averages.

Florida relies heavily on in-migration of nurses. In 1990, the Health Care Cost Containment Board stated in its report, **Beyond Shortage: Nursing Personnel in Florida**, that the State endorsed licensed nurses from other states at a rate twice that of new graduates from Florida nursing education programs, a practice that makes Florida a debtor to other states. It appears that the demand for nurses will out-pace supply during the next decade in Florida due to high dependence on in-migration during a time of national shortage, demands of special population subgroups, and projected expansion of positions.

XII. PHYSICIAN ASSISTANT EDUCATION

Physician assistants are health practitioners who care for patients under the supervision of a licensed physician. Physician assistants provide health care by evaluating, monitoring, diagnosing, counseling patients, and through therapeutic and preventive care. Physician assistants were introduced in the 1960s in an effort to reduce health care costs, compensate for the shortage of primary care physicians, and increase access to medical care services. The U.S. Department of Health and Human Services states that although physician assistants work mostly in primary care specialties, they are found in all medical specialties. Physician assistants provide care for underserved populations in rural areas and inner-city neighborhoods and are actively involved in the treatment of HIV-infected and AIDS patients. For a review of physician assistant preparation and the profession both statewide and nationally, refer to the reports published by the Postsecondary Education Planning Commission entitled **Medical Education in Florida** (1985) and **Comprehensive Health Professions Plan Review for Florida** (1988).

Education

The American Medical Association's Committee on Allied Health Education and Accreditation accredited 51 physician assistant programs in 1989. Typically, older students with previous health care experience in a related field enroll in physician assistant programs. In recent years, however, some programs began enrolling younger and/or less experienced students, necessitating modifications in training. Physician assistant programs require a minimum of two years of college prior to admission; however, nearly one-half of physician assistant students had a baccalaureate degree in 1987-88. The curriculum involves broadly-based primary care training and usually is two years in duration. Over the past few years modifications to the curriculum included information in areas such as geriatrics, home health care, alcohol and substance abuse, and prevention and treatment of AIDS victims.

Enrollees and Graduates: United States

The **Fifth Annual Report on Physician Assistant Educational Programs in the U.S., 1988-89** estimated that the total number of students enrolled in physician assistant programs was 2,514 in 1988-89. This represents an increase in enrollments, reversing the downward enrollment trend recorded between 1984-85 and 1987-88. Despite increases in enrollment, unfilled enrollment capacity is still reported. Of the entering class in 1988, 62 percent were women and over 20 percent were nonwhite, the majority of whom were black. The proportions of women and minorities in physician assistant program enrollments have increased, with some fluctuation, since the mid-1980s.

The 1988 graduating class was 8.3 percent black, 4.9 percent Hispanic, and 84.0 percent white, non-Hispanic (2.9 percent other). The proportion of minority graduates remained relatively stable in the late 1980s. For the past several years, training programs have graduated approximately 1,200 physician assistants annually.

Enrollees and Graduates: Florida

The University of Florida operates the only physician assistant program in the State. Total enrollment dropped from 44 in 1988 to 35 in 1989, a 20 percent decline. The percentage of women enrolled continued to climb, reaching 68.6 percent in Fall 1989, compared to 62 percent nationally in 1986. Enrollments of minority students included two black and two Hispanic students (5.7 percent each) and one Asian/Pacific Islander student (2.9%). The percentage of nonwhite students increased from 9.1 percent in Fall 1988 to 14.3 percent in Fall 1989, compared to 20.3 percent nationally in 1988-89 (Table 27).

TABLE 27

UNIVERSITY OF FLORIDA PHYSICIAN ASSISTING PROGRAM TOTAL UPPER LEVEL BACCALAUREATE ENROLLMENTS BY GENDER AND RACE/ETHNICITY FALL 1987 TO FALL 1989

FALL ENROLLMENTS	1987		1988		1989	
	NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT
Total	45	100	44	100	35	100
Male	19	42.2	14	31.8	11	31.4
Female	26	57.8	30	68.2	24	68.6
Black	1	2.2	2	4.5	2	5.7
Hispanic	3	6.7	1	2.3	2	5.7
Asian and Pacific Islander	-	--	-	--	1	2.9

Source: Board of Regents, Count of Student Records Including Fee Waivers, 1990.

TABLE 28

UNIVERSITY OF FLORIDA PHYSICIAN ASSISTING PROGRAM BACCALAUREATE DEGREES GRANTED BY GENDER AND RACE/ETHNICITY 1987-88 TO 1989-90

DEGREES GRANTED	1987-88		1988-89		1989-90	
	NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT
Total	26	100	31	100	29	100
Male	12	46.2	14	45.2	11	37.9
Female	14	53.8	17	54.8	18	62.1
Black	1	3.8	--	--	1	3.4
Hispanic	-	--	2	6.5	1	3.4
Asian and Pacific Islander	-	--	--	--	1	3.4

Source: Board of Regents, Postsecondary Completions HEGIS/IPEDS, 1990.

The University of Florida physician assistant program awarded 29 baccalaureate degrees in 1989-90, a 6.5 percent decrease from 1988-89. Of the 1989-90 graduates, three represented minority groups--one black, one Hispanic, and one Asian/Pacific Islander or 3.4 percent for each group (Table 28). National percentages in 1988 were higher for black graduates (8.3%) and for Hispanic graduates (4.9%). The proportion of minority enrollments and graduations fluctuated dramatically throughout the 1980s.

Licensure and Continuing Education

To be a practicing physician assistant in Florida, licensure (certification) is required by the Department of Professional Regulation Board of Medicine under Section 458.347, Florida Statutes. The Board of Medicine requires 100 hours of continuing education for the biennial renewal of licensure.

Labor Market: Supply and Demand

The Florida Department of Professional Regulation reports that the number of licensed physician assistants has increased steadily since 1978, the first year licensure was required, to 890 in 1989. This includes 35 chiropractic physician assistants, who were first licensed in 1987, and 69 osteopathic physician assistants, who were first licensed in 1984. As of January 1990, there were 718 physician assistants (632 allopathic) with active licenses resident in the State. The **1989 Florida Health Care Atlas** reports that in 1988, there were 6.6 physician assistants per 100,000 population, compared to 6.0 in 1985. The distribution of physician assistants varied throughout the State; 16 counties were without any physician assistants and only 14 counties had more than one in 1988.

The Florida Department of Labor and Employment Security, Bureau of Labor Market Information, projects that between 1987 and 2000, the number of physician assistants in Florida will increase by 1,310 (from 2,248 in 1987 to 3,558 in 2000). This represents an increase of 58.3 percent between 1987 and 2000, as compared to national projections for a 28 percent increase between 1988 and 2000. The Bureau projects 169 average annual openings for employment in Florida between 1987 and 2000, based on the projection for expansion of 101 positions and 68 vacancies due to retirement, death, or other separation from the work force.

Physician assistants provide cost effective primary care to underserved areas of the State and to patients with special needs such as the elderly, minority populations, and HIV/AIDS infected. Less than 20 percent of the anticipated demand will graduate annually from the University of Florida's program for the rest of the century. Favorable supply projections suggest that the State will continue to benefit from in-migration. Since physician assistants provide care to residents with special health needs and in underserved areas of the State, however, demand for physician assistants may out-pace supply.

XIII. PHYSICAL THERAPY AND OCCUPATIONAL THERAPY EDUCATION

Physical therapy and occupational therapy are characterized as allied health professions. The U.S. Department of Health and Human Services notes that physical therapists plan and administer treatment to relieve pain, improve functional mobility, maintain cardiopulmonary function, and limit disability of people suffering from disabling injury or disease. Occupational therapists work with mentally and physically disabled individuals to assist them in learning skills necessary to perform daily tasks, diminish or correct pathology, and promote and maintain health. For additional information concerning physical and occupational therapy preparation and professions, both statewide and nationally, refer to the reports published by the Postsecondary Education Planning Commission entitled **Allied Health Education in Florida** (1986) and **Comprehensive Health Professions Plan Review for Florida** (1988).

Education

Entry-level physical therapy preparation is obtained in bachelor's or master's degree programs; unlike other allied health professions, these programs have not experienced applicant shortages. Interest in physical therapy programs is attributed to the positive economic outlook for physical therapists, including rising salaries, growing autonomy, and high demand for graduates. Preparation for occupational therapy positions is obtained in baccalaureate degree, post-baccalaureate certificate, or master's degree programs.

Enrollees and Graduates: United States

Physical Therapy. In 1989 there were 130 entry-level physical therapy programs (bachelor's or master's degree) accredited by the American Physical Therapy Association's Commission on Accreditation in Physical Therapy Education. The number of programs increased 15 percent since 1985. In 1988, physical therapy programs nationally graduated 4,105 students. The number of graduates increased 43 percent from 1980 to 1985 and by 17 percent between 1985 to 1989.

Occupational Therapy. In 1988 there were 67 occupational therapy programs accredited by the Committee on Allied Health Education and Accreditation of the American Medical Association, an increase from 55 in 1982. Of the 67 schools offering programs, 63 offered baccalaureate degrees, 13 post-baccalaureate certificates, and 16 entry-level master's degrees. Total enrollment for programs offering basic occupational preparation increased 13 percent between 1981-82 (6,825 students) and 1988-89 (7,741 students). In 1988, 2,431 students graduated from occupational therapy programs representing an 18 percent increase over six years earlier.

Enrollees and Graduates: Florida

Physical Therapy. Florida Agricultural and Mechanical University, Florida International University, the University of Florida, and the University of Miami offer basic occupational preparation in physical therapy. Total upper-level baccalaureate enrollments in the State University System programs fluctuated over the past three years, increasing from 154 in 1987, to 190 in 1988, and then decreasing to 175 in 1989 (Table 29). The proportion of men in the public programs rose to 24.6 percent in 1989. The proportion of black students fluctuated between 6.8 and 7.4 percent, and black students were more likely to be found at Florida Agricultural and Mechanical University. Hispanic student participation increased over the three-year period to 15.4 percent; Hispanic students were more likely to be found at Florida International University.

TABLE 29

STATE UNIVERSITY SYSTEM PHYSICAL THERAPY PROGRAMS TOTAL UPPER LEVEL BACCALAUREATE ENROLLMENTS BY GENDER AND RACE/ETHNICITY FALL 1987 TO FALL 1989

	1987		1988		1989	
FALL ENROLLMENTS	NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT
Total	154	100	190	100	175	100
Male	32	20.8	39	20.5	43	24.6
Female	122	79.2	151	79.5	132	75.4
Black	11	7.1	13	6.8	13	7.4
Hispanic	13	8.4	21	11.1	27	15.4
Asian and Pacific Islander	3	1.9	4	2.1	3	1.7

Source: Board of Regents, Count of Student Records Including Fee Waivers, 1990.

The number of baccalaureate degrees granted in the State University System to physical therapy students rose to 110 in 1989-90, an increase of 53 percent over 1987-88 levels. The proportion of degrees granted to men fluctuated over the three-year period and was 22.7 percent in 1989-90. The proportion of black and Hispanic graduates also fluctuated and ended the period at 2.7 percent and 8.2 percent, respectively, in 1989-90 (Table 30). In 1989-90, the University of Miami conferred 38 degrees for physical therapy, bringing the total number of degrees completed in the State to 148 in 1989-90. Florida International University began offering a master's level program in physical therapy in Fall 1989.

TABLE 30

STATE UNIVERSITY SYSTEM PHYSICAL THERAPY PROGRAMS BACCALAUREATE DEGREES GRANTED BY GENDER AND RACE/ETHNICITY 1987-88 TO 1989-90

DEGREES GRANTED	1987-88 NUMBER	1987-88 PERCENT	1988-89 NUMBER	1988-89 PERCENT	1989-90 NUMBER	1989-90 PERCENT
Total	72	100	76	100	110	100
Male	13	18.1	24	31.6	25	22.7
Female	59	81.9	52	68.4	85	77.3
Black	2	2.8	7	9.2	3	2.7
Hispanic	3	4.2	7	9.2	9	8.2
Asian and Pacific Islander	-	--	-	--	1	0.9

Source: Board of Regents, Postsecondary Completions HEGIS/IPEDS, 1990.

Occupational Therapy. Florida Agricultural and Mechanical University, Florida International University, the University of Florida, and Barry University offer baccalaureate degree preparation for occupational therapy. In addition, master's level programs are offered by Florida International University and the University of Florida. Enrollments in the State University System programs fluctuated between Fall 1987 and 1989, with 254 students enrolled in Fall 1989 (Table 31). The proportion of men enrolled in the public programs decreased from 11.6 percent in Fall 1987 to 7.1 percent in Fall 1989. The proportion of black students fluctuated over the three-year period, ending in 1989 at 8.7 percent. The proportion of Hispanic students increased from 13.5 percent in Fall 1987 to 16.1 percent in 1989. Both black and Hispanic students were more frequently enrolled at Florida International University. The charter class for occupational therapy at Barry University enrolled 29 students during Fall 1989.

Since the occupational therapy programs at Florida Agricultural and Mechanical University and Barry University were initiated in Fall 1989, they have not graduated any students to date. The number of degrees granted from the other two public programs increased from 56 in 1987-88 to 60 in 1989-90. The proportion of male graduates fluctuated between 1987-88 and 1989-90, ending at ten percent. The proportion of black students graduating has fluctuated during the three-year period, ending at 1.7 percent in 1989-90. The proportion of Hispanic graduates increased to 16.7 percent in 1989-90. Minority students were more likely to have graduated from Florida International University (Table 32). During the period 1987-88 to 1989-90, six master's level students graduated from the University of Florida, all of whom were women and one of whom was Asian/Pacific Islander.

TABLE 31

STATE UNIVERSITY SYSTEM OCCUPATIONAL THERAPY PROGRAMS
TOTAL UPPER LEVEL BACCALAUREATE ENROLLMENTS BY GENDER AND RACE/ETHNICITY
FALL 1987 TO FALL 1989

FALL ENROLLMENTS	1987 NUMBER	 PERCENT	1988 NUMBER	 PERCENT	1989 NUMBER	 PERCENT
Total	207	100	279	100	254	100
Male	24	11.6	29	10.4	18	7.1
Female	183	88.4	250	89.6	236	92.9
Black	8	3.9	35	12.5	22	8.7
Hispanic	28	13.5	38	13.6	41	16.1
Asian and Pacific Islander	2	1.0	6	2.2	3	1.2

Source: Board of Regents, Count of Student Records Including Fee Waivers, 1990.

TABLE 32

STATE UNIVERSITY SYSTEM OCCUPATIONAL THERAPY PROGRAMS
BACCALAUREATE DEGREES GRANTED BY GENDER AND RACE/ETHNICITY
1987-88 TO 1989-90

DEGREES GRANTED	1987-88 NUMBER	 PERCENT	1988-89 NUMBER	 PERCENT	1989-90 NUMBER	 PERCENT
Total	56	100	59	100	60	100
Male	8	14.3	5	8.5	6	10.0
Female	48	85.7	54	91.5	54	90.0
Black	-	--	2	3.4	1	1.7
Hispanic	2	3.6	6	10.2	10	16.7
Asian and Pacific Islander	-	--	-	--	1	1.7

Source: Board of Regents, Postsecondary Completions HEGIS/IPEDS, 1990.

Licensure and Continuing Education

Physical therapists are regulated through the Board of Physical Therapy, Department of Professional Regulation. Physical therapists are licensed under Sections 486.207 to 486.081, Florida Statutes. Initial licensure and renewal for physical therapists licensed prior to 1989 is contingent upon satisfactory completion of three hours of education concerning HIV/AIDS. Licensure renewal is required biennially through the Board of Physical Therapists.

Occupational therapists are regulated through the Board of Occupational Therapy, Department of Professional Regulation. Occupational therapists are licensed under Sections 468.207 to 468.215, Florida Statutes. Licensure renewal is required biennially through the Board of Occupational Therapy and does not require the completion of continuing education hours.

Labor Market: Supply and Demand

In 1990, there were 1,847 Florida residents with active licenses for occupational therapy and 4,476 for physical therapy. The Florida Department of Labor and Employment Security, Bureau of Labor Market Information projects that between 1987 and 2000, the number of physical therapists in Florida will increase by 2,819 (from 3,084 in 1987 to 5,903 in 2000). This represents an increase of 91.3 percent between 1987 and 2000, as compared to national projections for a 57 percent increase between 1988-2000. The Bureau projects that between 1987 and 2000 the number of occupational therapists will increase by 780. This represents an increase of 73.8 percent increase of occupational therapists between 1987 and 2000, as compared to national projections for a 49 percent increase between 1988 and 2000.

The Bureau anticipates a total of 262 average annual openings for employment for physical therapists in Florida between 1987 and 2000, based on the projection for expansion of 217 positions and 45 vacancies due to retirement, death, or other separation from the work force. A total of 93 average annual openings for employment for occupational therapists in Florida is expected between 1987 and 2000, based on the projection for the expansion of 60 positions and 33 vacancies due to retirement, death, or other separation from the work force.

The number of new physical therapist licenses granted, based on national and state examination scores, increased from 198 in 1988-89 to 293 in 1989-90. Florida institutions graduate approximately one-half of the number of new licenses granted and, on average, approximately one-half of the projected number of physical therapist annual openings in the State. With the addition of graduates from the new occupational therapy programs at Florida Agricultural and Mechanical University and Barry University, Florida institutions will graduate approximately as many occupational therapists as the projected number of annual openings in the State.

Supply projections for occupational therapists in Florida suggest that projected demand will be met for the rest of the decade, despite reported national shortages. While supply projections for physical therapists suggest projected demand will be met if current levels of in-migration are maintained, shortages of physical therapists are severe nationwide. Dependance on in-migration of physical therapists during a time of national shortages could lead to actual demand out-pacing supply for Florida.

XIV. DENTAL AUXILIARIES

Dental hygienists function as oral health educators and clinicians whose primary responsibility is providing preventive oral hygiene services and procedures to assist the public in maintaining optimum oral health. The type and frequency of specific duties vary according to the state in which they practice, the level of their education and experience, and the health care setting. Dental assistants provide chair-side assisting and supportive services, such as sterilizing equipment, transferring instruments during operative procedures, taking impressions of study casts, placing and removing periodontal dressings, exposing x-rays, preparing dental filling materials, providing oral hygiene instruction, and performing selected laboratory and clerical office procedures. In addition to performing chair-side assisting procedures, they provide general management functions within the dental office environment as well.

Dental hygienists employed in private dental offices provide direct patient care for an average of eight patients per day, or usually one patient scheduled per hour. Dental hygienists also practice in nontraditional practice settings such as public health agencies, clinics, hospitals, dental colleges, health maintenance organizations, and business and industry. They are increasingly moving into areas with special populations such as V.A. hospitals, day care clientele, homehealth care, and geriatric centers. The dental health needs of an aging population require specific training and skills from the dental profession. Geriatric dentistry has become a respected and demanding specialty within the State of Florida as well as the nation. For a review of dental auxiliaries both statewide and nationally, refer to the reports published by the

Postsecondary Education Planning Commission entitled **Comprehensive Health Professions Plan Review for Florida** (1988) and **Dental Education in Florida**, (1989).

Education

The dental hygiene education curriculum encompasses a two-year, associate degree program within an accredited postsecondary institution. The Commission on Accreditation for the American Dental Association is the accrediting agency for all dental hygiene programs. The length of the dental hygiene curriculum for programs within Florida varies from 61 required credits to a maximum of 100 credits. Graduates are eligible to take the National Board Examination and the and State Board Examination to become licensed dental hygienists.

Dental assistants may be formally trained in certificate programs through vocational education centers, community college programs, or one of the few independent dental assisting certificate programs located within the State. In response to legislative action, the State of Florida mandated in 1989 that all dental assisting programs in the State be leveled to postsecondary adult vocational education to eliminate unnecessary duplication of programs. Articulation arrangements permit the transfer of postsecondary adult vocational education courses to college credit dental hygiene or other appropriate programs. Effective July 1989, no academic credit could be awarded for dental assisting studies. Dental assistants may also receive on-the-job training through employment opportunities.

Enrollees and Graduates: Florida

Dental Hygiene. The State Board of Community Colleges reports that between Fall 1987 and Fall 1989 total program enrollments in dental hygiene for the State rose from 591 students to 705 students. Of the 705 students enrolled in 1989, the greatest percentage (98.9%) was female. While the data indicate increases in the total enrollment pattern in dental hygiene, there have been steady, although slight, decreases in the proportion of blacks and Hispanics (Table 33).

The State Board of Community Colleges reports that between 1987-88 and 1989-90 the number of associate of science degrees granted in dental hygiene rose from 205 to 225. Of the 225 associate degrees granted in 1989-90, none were received by males. The data indicate that in 1989-90 only four blacks (1.8%) received associate of science degrees in dental hygiene, while 14 Hispanics (6.2%) and two Asian/Pacific Islanders (0.9%) received associate degrees in dental hygiene. The number and proportion of minority students fluctuated during the 1987-88 to 1989-90 time period (Table 33).

TABLE 33

COMMUNITY COLLEGE DENTAL HYGIENE PROGRAMS TOTAL ENROLLMENTS AND ASSOCIATE OF SCIENCE DEGREES GRANTED BY GENDER AND RACE/ETHNICITY 1987-88 TO 1989-90

	1987-88		1988-89		1989-90	
	NUMBER	**PERCENT**	**NUMBER**	**PERCENT**	**NUMBER**	**PERCENT**
Total Enrollments	**591**	**100**	**649**	**100**	**705**	**100**
Male	5	0.8	5	0.8	8	1.1
Female	586	99.2	644	99.2	697	98.9
Black	21	3.6	20	3.1	19	2.7
Hispanic	60	10.2	64	9.9	65	9.2
Asian and Pacific Islander	6	1.0	10	1.5	10	1.4
Degrees Granted	**205**	**100**	**221**	**100**	**225**	**100**
Male	2	1.0	2	0.9	--	--
Female	203	99.0	219	99.1	225	100
Black	4	2.0	5	2.3	4	1.8
Hispanic	22	10.7	28	12.7	14	6.2
Asian and Pacific Islander	1	0.5	3	1.4	2	0.9

Source: State Board of Community Colleges (AA1-A File), 1990.

Dental Assisting. Enrollments in dental assisting programs have continued to decline within the State as well as nationally. The Division of Vocational, Adult, and Community Education reports that program enrollments in dental assisting programs totaled 735 in 1989-90, compared to 788 reported for 1987-88. The program enrollment data for 1989-90 indicate that 209 enrollees were male, representing 28.4 percent of the students. Program completions increased from 99 in 1987-88 to 120 in 1989-90. The percentage of male graduates increased slightly to 1.7 in 1989-90. Percentages increased for black graduates to 12.5 and for Hispanic graduates to 6.7 in 1989-90.

Some decline in enrollments may be attributed to the availability of more competitive and rewarding opportunities for students who have traditionally selected dental assisting as an occupational field. The perceived transitory nature, low earning potential and low professional status of dental assistants continues to impact recruitment and enrollment efforts throughout the State.

TABLE 34

FLORIDA DISTRICT VOCATIONAL CENTER DENTAL ASSISTING PROGRAMS
TOTAL CERTIFICATE PROGRAM ENROLLMENTS AND COMPLETIONS
BY GENDER AND RACE/ETHNICITY
1987-88 TO 1989-90

	1987-88		1988-89		1989-90	
	NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT
Total Enrollments	788	100	758	100	735	100
Male	240	30.5	232	30.6	209	28.4
Female	548	69.5	526	69.4	526	71.6
Black	60	7.6	54	7.1	61	8.3
Hispanic	101	12.8	162	21.4	162	22.0
Asian and Pacific Islander	3	0.4	6	0.8	10	1.4
Program Completions	99	100	98	100	120	100
Male	--	--	1	1.0	2	1.7
Female	99	100	97	99.0	118	98.3
Black	8	8.1	10	10.2	15	12.5
Hispanic	9	9.1	13	13.3	8	6.7
Asian and Pacific Islander	--	--	1	1.0	1	0.8

Source: Division of Vocational, Adult, and Community Education, ESE 531, Final Class Reports, 1990.

Licensure and Continuing Education

The dental hygienist is the only dental auxiliary required in statute to be licensed to practice. Dental hygienists are licensed by the Department of Professional Regulation, Board of Dentistry, under Chapter 466, Florida Statutes. Individuals seeking licensure must apply to the Department of Professional Regulation to take the required State Board Examination. Dental hygienists are required by statute to document 24 hours of continuing education every two years to renew their license to practice dental hygiene. Florida statute mandates that dental assistants and hygienists document a current course in AIDS education and cardiopulmonary resuscitation.

Dental assistants have the option of obtaining national certification. As certified dental assistants, they are required to obtain 12 hours of continuing education each year to renew certification from the National Association for Dental Assisting. Since they are not a state licensed profession, continuing education requirements may be imposed through the national accrediting association, professional association, or the dental office in which they find employment.

Labor Market: Supply and Demand

According to the **1990 Occupational Outlook Handbook** edition, the employment of dental hygienists is expected to grow about as fast as the average for all occupations through the year 2000 in response to the increasing demand for dental care. Demand will be stimulated by population growth, greater retention of natural teeth by middle-aged and elderly persons, growing public awareness of the importance of oral health, rising real incomes, and availability of dental insurance. The **1990 Occupational Outlook Handbook** reports that employment prospects for dental hygienists and dental assistants are affected by practice patterns in dentistry as well as by the level of demand for dental care. The Department of Professional Regulation reports that the total number of licensed dental hygienists has increased from 1,284 in 1971 to 7,622 in 1989, while the number of Florida resident dental hygienists with active licenses has increased from 1,003 in 1971 to 4,962 in 1990. The **1990 Florida Health Care Atlas** reports that in 1971, the ratio of active dentists to dental hygienists was 2.32; in 1990, the ratio had dropped to 1.36. The distribution of dental hygienists throughout the State is reflected in the distribution of dentists. In 1989-90, 404 new licenses were granted to dental hygienists in Florida based on national and state examination scores.

The Florida Department of Labor and Employment Security, Bureau of Labor Market Information, projects that between 1987 and 2000 the number of dental auxiliaries in Florida will increase by 3,186 dental hygienists (from 5,302 in 1987 to 8,488 in 2000) and by 4,020 dental assistants (from 6,803 in 1987 to 10,823 in 2000). These numbers represent increases between the year 1987 and 2000 of 60.1 percent for dental hygienists (compared to national projections for an 18 percent increase between 1988 and 2000) and of 59.1 percent for dental assistants (compared to 19 percent nationally) for the same time periods. The Bureau projects a total of 301 average annual openings for employment in Florida between 1987-2000, based on the projection for expansion of 245 positions and 56 vacancies due to retirement, death, or other separation from the work force. For dental assistants, the Bureau projects a total of 409 average annual openings for employment in Florida between 1987 and 2000, based on the projections for expansion of 309 positions and 100 vacancies due to retirement, death, or other separation from the work force.

Dental hygiene programs in the State of Florida graduated 225 dental hygienists in 1989-90, representing approximately three-fourths of the projected annual demand of 301 openings in the State. Since the demand for dental hygienists in Florida is projected to be more than three times as great as national demand for the rest of the century, employment opportunities within the State should continue to encourage in-migration. It appears from data pertaining to degrees granted, new licenses granted, and labor market projections that the State will have a sufficient supply of dental hygienists to meet projected demands.

Formal dental assisting programs in the State of Florida graduated approximately 30 percent of the projected demand for annual openings. It appears that with the number of graduates, along with the dental assistants trained on-the-job and the number of dental assistants who migrate to Florida, the State will also have a sufficient supply of dental assistants to meet projected demand.

REFERENCES

California Postsecondary Education Commission. (1986). **Health sciences education in California, 1985-86.** Sacramento, CA: Author.

Carnegie Foundation for the Advancement of Teaching. (1989, September/October). Enrollment ups and downs in dental and veterinary fields. **Change: The Magazine of Higher Learning,** 27-29.

Comprehensive Health Planning, Office of Regulation and Health Facilities. (1989). **1989 Florida health care atlas.** Tallahassee, FL: Department of Health and Rehabilitative Services.

Comprehensive Health Planning, Office of Regulation and Health Facilities. (1990). **1990 Florida health care atlas.** Tallahassee, FL: Department of Health and Rehabilitative Services.

Council on Dental Education. (1990). **Annual report: Dental education, 1989-90.** Chicago: American Dental Association.

Council on Dental Education. (1990). **Supplement 2: Trend analysis, 1989-90.** Chicago: American Dental Association.

Florida Pepper Commission on Aging. (1990). **Master plan on aging for Florida.** Tallahassee, FL: Author.

Florida State University. (1990). **Program in medical sciences profile, 1971-1990.** Tallahassee, FL: Author.

Health Care Cost Containment Board. (1990). **Beyond the shortage: Nursing personnel in Florida.** Tallahassee, FL: Department of Health and Rehabilitative Services.

Monaghan, P. (1990, May 23). Advances in science and technology spur veterinary-school reforms. **The Chronicle of Higher Education,** A-29.

Penna, R., & Sherman, M. (1990, Fall). Degrees conferred by schools and colleges of pharmacy, 1988-89. **American Journal of Pharmaceutical Education,** 54, 304-319.

Penna, R., & Sherman M. (1990, Winter). Enrollments in schools and colleges of pharmacy, 1989-90. **American Journal of Pharmaceutical Education,** 54, 451-477.

Postsecondary Education Planning Commission. (1982). **Master plan for Florida postsecondary education.** Tallahassee, FL: Department of Education.

Postsecondary Education Planning Commission. (1983). **Health professions report.** Tallahassee, FL: Department of Education.

Postsecondary Education Planning Commission. (1983). **A study of the need for new and expanded programs in nursing in Florida**. Tallahassee, FL: Department of Education.

Postsecondary Education Planning Commission. (1983). **A study of the need for new and expanded programs in public health in Florida**. Tallahassee, FL: Department of Education.

Postsecondary Education Planning Commission. (1984). **Dental education in Florida**. Tallahassee, FL: Department of Education.

Postsecondary Education Planning Commission. (1984). **The need for chiropractic education in Florida**. Tallahassee, FL: Department of Education.

Postsecondary Education Planning Commission. (1985). **Medical education in Florida**. Tallahassee, FL: Department of Education.

Postsecondary Education Planning Commission. (1986). **Allied health education in Florida**. Tallahassee, FL: Department of Education.

Postsecondary Education Planning Commission. (1987). **Pharmacy education in Florida**. Tallahassee, FL: Department of Education.

Postsecondary Education Planning Commission. (1987). **Veterinary medical education in Florida**. Tallahassee, FL: Department of Education.

Postsecondary Education Planning Commission. (1988). **Comprehensive health professions plan review for Florida**. Tallahassee, FL: Department of Education.

Postsecondary Education Planning Commission. (1988). **Nursing education in Florida**. Tallahassee, FL: Department of Education.

Postsecondary Education Planning Commission. (1989). **Dental education in Florida**. Tallahassee, FL: Department of Education.

Postsecondary Education Planning Commission. (1989). **Public health education in Florida**. Tallahassee, FL: Department of Education.

Postsecondary Education Planning Commission. (1991). **Student access to higher education**. Tallahassee, FL: Department of Education.

United States Congress, Office of Technology Assessment. (1990). **Health care in rural America**. (Publication No. OTA-H-434). Washington DC: U.S. Government Printing Office.

United States Department of Health and Human Services. (1990, March). **Seventh report to the President and Congress on the status of health personnel in the United States**. (Publication No. HRS-P-OD-90-1). Washington, DC: U.S. Government Printing Office.

United States Department of Labor. (1990, April). **Occupational outlook handbook, 1990-91.** (Bulletin No. 2350). Washington, DC: U.S. Bureau of Labor Statistics.